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RESIDUAL WASTE MANAGEMENT RESEARCH AND PLANNING PROJECT

ENVIRONMENTAL PROTECTION AGENCY

SEPTEMBER 1975

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RESIDUAL WASTE MANAGEMENT RESEARCH AND PLANNING PROJECTS

SEPTEMBER 1975

WATER PLANNING DIVISION
ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON , D.C. 20460

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This book contains selected abstracts of projects that are underway or that have been completed and publications that are available on the subject of residual wastes and their impact of ground and surface waters. They are arranged by types of residual wastes and are further catagorized into the various kinds. The abstracts are cross-reference where necessary.

The abstracts provide project or publication identification, a brief summary, the status of the project, point of contact and/or source of information, and acquisition details. This handbook is oriented for an audience who may have diverse backgrounds in technical management skills.

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Water Planning Division
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Washington, D. C. 20460

FOREWORD

Section 208 (P.L. 92-500, The Federal Water Pollution Control Act, Amendments of 1972) sets forth a comprehensive program that has been established to solve water pollution problems in an environmentally acceptable manner. The purpose of this handbook is to provide information on the existence, status, and availability of projects, and publications that relate to subsections (J) and (K) of Section 208, namely; "(J) a process to control the disposition of all residual waste generated in such area which could affect water quality; and (K) a process to control the disposal of pollutants on land or in subsurface excavations within such area to protect ground and surface water quality."

The information in this handbook has been specially selected to provide planners with technical, legal, institutional, social, economic and environmental information to assist in the establishment of residual waste management pursuant to Section 208.

Summary

This Residual Waste Management Research and Planning Projects handbook contains selected abstracts of projects that are underway or that have been completed and publications that are available on the subject of residual wastes and their impact on ground and surface waters.

The abstracts are arranged by types of residual waste, i.e. sludge, liquids, and solids. The types are further categorized into the various kinds, i.e. commerical wastes, municipal wastes, industrial wastes, mining wastes, etc.. The abstracts are cross-referenced where necessary.

The abstracts provide project or publication identification, a brief summary, the status of the project, point of contact and/or source of information, and acquisition details.

This handbook is designed to provide timely information for the 208 planning program. It is oriented for an audience who may have diverse backgrounds in technical and management skills. These individuals will generally be municipal and state planners, engineers, and technical consultants.

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331. "Regional Management of Animal Manures"
332. "Framework for Analyzing and Selecting Among Alternatives for Regional Solid Waste Management"
333. "NEC Environmental Impact Study"
334. "Environmental Carrying Capacity as a Concept in Comprehensive Regional Planning - A Feasibility Study"
334. "Joint Siting of Electrical Power Plant and Advanced Wastewater Treatment Plant Feasibility Study"
336. "The Better Whey: A Dilemma" Proceedings-Second National Symposium on Food Processing Wastes"

337. Other

339. "Comprehensive Studies of Solid Waste Management"
340. "Projects in the Industrial Control Division"
341. "Solid Waste Disposal Economics"
342. "Urban Solid Waste Management"
343. "Areawide Refuse Disposal"

345. Reference

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Attention: Librarian
SWIRS (Solid Waste Information Retrieval Service)
P.O. Box 2365
Rockville, Md. 20852

USER'S GUIDE

This handbook is divided into seven sections: (1) residual waste disposal; (2) residual waste reclamation; (3) evaluation of alternatives; (4) environmental impact; (5) socio-economic and intergovernmental aspects; (6) models; and (7) planning and management. Sections one through five are further divided into parts to facilitate pinpointing specific subjects of interest within each section. For example, the section on residual waste disposal is divided into three parts: sludge disposal, solids disposal, and liquids disposal. Furthermore, each part is divided into specific categories, e.g. agricultural wastes, mining wastes, municipal wastes, industrial wastes, commercial wastes, etc..

Abstracts that relate to more than one category of residual waste have been cross-referenced under their appropriate headings. The entire abstract has been reprinted to eliminate the chore of searching back and forth through the handbook for the cross-referenced material.

Information provided in the abstracts include the following:

1. Project Title	In most cases this is the actual title of the publication. For those projects not published, the title is only a description in most cases.
2. Abstract/Summary	Where publications are available, the information is a abstract of that publication. For ongoing projects, the abstract/summary identifies the project, and where possible, states findings and/or expectations, and the present status of the projects.
3. Status	This gives the estimated date of completion of the project, a progress report, where possible, the availability of publications, the costs and acquisition source.
4. Information/Contact	This lists persons responsible for distributing information about the projects or publications and where they may be obtained.

ACKNOWLEDGMENTS

A great deal of cooperation was received during the preparation of this handbook from research investigators in academia and industry, and government officials throughout the United States. We are extremely grateful for their assistance.

The abstracts of technical reports are reproduced through the courtesy of the National Technical Information Service, 5285 Port Royal Road, Springfield, VA., 22161. Copies of the full reports may be ordered from NTIS.

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RESIDUAL WASTE DISPOSAL

Section I

Part I Sludge Disposal

Part II Solid Disposal

Part III Liquid Disposal

RESIDUAL WASTE DISPOSAL

A. Water Treatment Sludges

PROJECT/TITLE

Reuse of Solid Waste From Water-Softening Processes

CITATION

Nelson, Raynor D.; Vey, Eben IIT Research Institute, Chicago, Ill.
Final Report

ABSTRACT/SUMMARY

The report summarizes a study of several methods for dewatering a water-softening sludge. Beneficial uses of the dewatered sludge are evaluated. Vacuum filtration after gravity thickening was found to be more economical for the area studied, the Village of Park Forest, Illinois, than centrifuging, lagooning or sand bed drying. The study found that in a dry powder or almost dry condition, the sludge has a potential use as a mineral filler in paints, floor coverings, caulking, and bituminous products, and as a soil admixture and/or soil conditioner.

STATUS

Publication is available from NTIS PB- 224820
$4.25/MF $1.45

Information Contact

N/A

Pages 2, 3 and 4 are blank.

TITLE/PROJECT

Disposal of Waterworks Sludges at Sewage Treatment Plants

ABSTRACT

The objectives of this project were to determine by a pilot plant study, the effects that doses of waterworks sludge has on activated sludge.

Several doses of waterworks sludge were added to the activated sludge process, and the phosphate-removing ability of the waterworks sludge was determined by sampling sewage outlets. The effects of the addition of waterworks sludge on the efficiency of operation was determined in terms of COD, and SS removals and turbidity of the final effluent.

Sludge from a waterwork was fed to a small 200 gal per day power plant with very little adverse effects on the sewage treatment plant with the exception of the increased amount of sludge.

The report has limited application in that there are only a few cities that have combined water and sewage plants. The tests were done in Philadelphia, Milwaukee and other cities where this combination is present.

STATUS

The project was completed in 1972. Publication Data: American Waterworks Journal 6/73

INFORMATION CONTACT

B. V. Salotto
U.S. EPA/NERC
5555 Ridge Avenue
Cincinnati, Ohio 45213
(513) 684-8270

B. Domestic Wastewater/Sewage

PROJECT/TITLE

Sludge Processing, Transportation, and Disposal/Resource Recovery; Planning Perspective

CITATION

N/A

ABSTRACT/SUMMARY

A methodology was developed in this report for use in the 208 planning process for the evaluation of alternatives for the ultimate disposal of residual wastes generated in municipal wastewater treatment plants. This methodology considered technical, economic, social, and institutional factors pertinent to a thorough review of alternatives.

Residual wastes generated in municipal wastewater treatment plants were characterized. Handling and treatment processes for the residual wastes were discussed and evaluated in light of qualitative and quantitative changes to the residual wastes. Liquid, gaseous, and solid sidestreams produced in residual waste treatment were evaluated and rail, pipeline, barge, and truck transport of residual wastes were analyzed.

Environmental, operational, and institutional constraints to the use of ocean disposal, lagoons, sanitary landfills, sludge recycling, and land reclamation were presented.

STATUS

Completed in Feb. 1975 - EPA Publication - Contract # 68-01-3104
Publication Pending

INFORMATION CONTACT

Dr. Dean Neptune
Water Planning Division/Planning Assistance
401 M St. S.W.
Wash. D.C. 20460
(202) 426-2474

B. Domestic Wastewater/Sewage

PROJECT/TITLE

System Alternatives in Oxygen Activated Sludge

CITATION

N/A

ABSTRACT/SUMMARY

An oxygen activated sludge system with co-current contacting of oxygen and mixed liquor in a plug flow reactor was operated on District of Columbia primary effluent during a two-year period over a wide range of loading (F. M. 0.26 to 2.0) with Solids Retention Times (SRT) from 2.0 to 13.0 days at the EPA-DC Pilot Plant.

STATUS

Publication Pending

INFORMATION CONTACT

EPA
D. F. Bishop
(513) 684-8353

B. Domestic Wastewater/Sewage

PROJECT/TITLE

Sewage Disposal On Forest and Associated Lands

CITATION

ABSTRACT/SUMMARY

The objective of this project is to determine methods for disposal and utilization of sewage effluent and sludge on forest lands without pollution of ground and surface waters, determine the soil physical and chemical characteristics necessary for proper sewage effluent and sludge disposal and renovation on forest lands, and determine the effects of sewage effluent and sludge applications on native and exotic forest vegetation.

Municipal and industrial sewage effluents were applied to a comprehensive range of solids and forest vegetation at field locations in conjunction with municipal land disposal projects. Soil and ground water samples were analyzed for nutrient elements and for potentially toxic materials. Changes in composition in native plant communities and the growth of native and exotic plants were studied following application of chlorinated secondary sewage effluent, wastewater from sewage lagoons, and stabilized sewage sludge to forest lands.

STATUS

The project is a continuing one. Considerable data has been collected that shows that nitrogen is the major pollutant. Reports may be obtained upon request.

INFORMATION CONTACT

After 9/1/75

Stephen Nesbitt
North Central Forest Extension Service
Harrison Road
East Lansing Michigan
(616) 775-7776

B. Domestic Wastewater/Sewage

PROJECT/TITLE

Combined Sludge Processing Project

CITATION

N/A

ABSTRACT/SUMMARY

CCCSD has built an Advanced Treatment Test Facility (TTF) to treat raw sewage with lime followed by biological nitrification and denitrification at up to 2.5 MGD. The excess lime sludge is dewatered in a pair of centrifuges operated in series to separate calcium carbonate from calcium phosphate organic matter and inerts. Calcium carbonate is to be converted to recovered lime in one set of multiple heart furnaces and the residual sludge will be incinerated in another set of furnaces. This proposal documents the studies already carried out leading to the above conclusions and fills in engineering and analytical data necessary to make a complete report.

STATUS

Publication: Sludge Processing For Combined Physical-Chemical-Biological Sludges
GPO-EP 1.23/2:R2-73-250 $2.10
NTIS/PB 223 341

INFORMATION CONTACT

P. H. Caldwell
Central Contra Costa Sanitation District
Walnut Creek, California

B. Domestic Wastewater/Sewage

PROJECT/TITLE

Lime Stablized Sludge: Its Stability and Effect on Agricultural Land

CITATION

N/A

ABSTRACT/SUMMARY

An optimum system for the lime stabilization of municipal sewage sludge was first developed and evaluated. The primary objectives of this work were (1) to determine the degree of stability induced in a sludge by lime addition and (2) to determine the effects of spreading lime-stabilized sludge on agricultural land. Lime doses and contact times required to eliminate the pathogenic bacteria and odors from raw sludge were determined by laboratory studies, and the information obtained was translated into design and operational parameters for a pilot scale, continuous flow process. Physical, chemcial and biological characteristics of both the raw and stabilized sludge, were measured. Soil and crop studies, both in a greenhouse and on controlled outdoor plots, were performed to determine the effects of spreading lime-stabilized sludge. Effective lime stabilization of sludge was accomplished by elevating the pH to 12.0 with lime addition and maintaining the pH level for at least 30 minutes.

STATUS

Publication Pending 1975
#670/2-75-012

INFORMATION CONTACT

EPA
J.E. Smith, Jr.
(513) 684-8267

B. Domestic Wastewater/Sewage

PROJECT/TITLE

Using Cropland For Sewage Wastewater And Sludge Disposal W. E. Sopper

CITATION

N/A

ABSTRACT/SUMMARY

The objective was to determine the interaction of soils and plants with sewage wastewater and sludge disposed on cropland and forestland, with emphasis on P, boron, and N reactions in the soil and with the biosphere and on the soil's potential for removing N from wastes by denitrification; develop systems for land disposal of wastewater and sludge.

Hydrologic effects such as perched water tables, interflow and runoff were measured.

STATUS

Completed Publication: Conference on Recycling Treated Wastewater
Through Forest and Cropland
GPO-EPI.23/2:660/2-74-003 $1.20
NTIS-PB 236313/AS

INFORMATION CONTACT

N/A

B. Domestic Wastewater/Sewage

PROJECT/TITLE

Review of Experience With Landspreading Liquid Sewage Sludge - A Bibliography

CITATION

N/A

ABSTRACT/SUMMARY

The objective of this program was to provide a critical review of existing information and operational experiences in landspreading of liquid sewage sludge. Major emphasis was given to obtaining information concerning unreported landspreading operations currently employed in this country through a telephone survey and visits to representative treatment plants and associated landspreading operations. This information was evaluated with respect to present technology, and environmental impacts from landspreading including evaluation of landspreading subsystems relating to sludge handling and conditioning modes of transport, spreading techniques, and soil and/or crop responses. Further this program also provided a summarization and an updating of sewage sludge landspreading practices found in the literature. An evaluation of the data obtained will identify deficiencies where additional studies are needed and aid in the development of proper design criteria for landspreading systems.

The investigator found that only 3 or 4 sewage treatment plants had a water quality program. There is a lack of intensive monitoring of waste programs, though there is an abundance of field work being done.

Research revealed that approximately 400 plants in the five most populous regions in the U.S. have been landspreading sewage sludge without monitoring for over 50 years.

The completed bibliography contains short histories with annotated bibliographies of 25 treatment plants visited by the researchers.

STATUS

Project is completed and publication is expected in August, 1975

INFORMATION CONTACT:

Office of Research Monitoring
G. K. Dotson
NERC - Cinn., Ohio

B. Domestic Wastewater/Sewage

PROJECT/TITLE

West Shade River Abatement Demonstration Project

CITATION

N/A

ABSTRACT/SUMMARY

The concepts of sand abatement, strip-mine reclamation and mine-acid control are the objectives of the project. The demonstration project will seek to show how the use of sludge, fertilizing, liming and other minor techniques will permit the growth and self-regeneration of various grasses, shrubs and trees.

The demonstration project is being conducted in Meigs County, Ohio, which is a part of Appalachia. Severe erosion problems occurring in certain strip-mine areas can be eliminated or controlled utilizing methods and materials which have been researched. Sand erosion from high walls and spoil banks causes considerable property loss due to the deposition of sand over once-tillable soils and the clogging of existing waterways.

One of the problems encountered in this project is the distance from which the sludge had to be transported. The transportation of sludge from the waste treatment facility to the Appalachian hills is expensive.

STATUS

A final report is pending

INFORMATION CONTACT

Appalachian Regional Commission
C. Meir
State Department of Natural Resources
Columbus, Ohio 43212
(614) 466-3066

B. Domestic Wastewater/Sewage

PROJECT/TITLE

The Role of Sewage Effluent and Sludge in the Introduction of Mercury Into Marine and Agricultural Ecosystems

CITATION

N/A

ABSTRACT/SUMMARY

The proposed work will 1) determine the significance of mecury input into the estuarine environment by effluent and sludge disposal, 2) determine and explain the variations in mercury concentration observed in sewage treatment plants, 3) determine the input of mercury to the marine system by rain and runoff, 4) continue studies on the distribution of mercury in the local (Carteret County, North Carolina) estuaries comparing a system receiving effluent (Calico Creek, Morehead City, North Carolina) with a variety of less affected areas, 5) determine the rate of mercury accumulation in marine organisms which are fed on sewage sludge, 6) determine the rate of uptake of mercury by vegetables which are grown in soil enriched with sewage sludge. Coldvapor atomic absorpiton analysis of mercury will be used.

STATUS

The project is partially finished, and the investigators state that they have a pretty clear picture of the impact of mercury in the estuarine environment. Studies are being conducted at a small town Moorehead City treatment plant (15,000 pop.). Study has shown a very distinct pattern of mercury distribution in estuaries and animals. The distribution of mercury is very restricted in distance. It remains very close to the outfall of the sewage treatment plants.

A town of comparable size and adjacent to Moorehead has one half to one third less mercury in its effluent and sludge. There are no industrial sources in either town. It is presently theorized that the mercury contamination may have come from the use of house paints containing mercury. Fungi are a problem in the area and mercury was used as an inhibitor at one time. The contamination may be resulting from storm water runoff.

INFORMATION/CONTACT

Dr. R. T. Barber
Duke U.
Marine Labo.
Beaufort, N. Carolina 28516 919-728-2111

TITLE/PROJECT

Feasibility of Using Forest Land for Sludge Disposal

CITATION

N/A

ABSTRACT/SUMMARY

This project is investigating the feasibility of using forest ecosystems to absorb nutrient additions in the form of sewage sludge. This research is important to the current problem of water pollution caused by nutrients leaching from sludge disposed of either by dumping at landfill sites or by other means that do not incorporate recycling or nutrient removal.

STATUS

Sludge from a nearby municipality and from recreation complexes in the White Mountain National Forest was landspread in June, 1975. Preliminary studies have been completed, but impact (environmental) work has just started. The project is scheduled to be completed by next summer (1976)

INFORMATION CONTACT

J. M. Hornbeck
University of New Hampshire Graduate School
Durham, New Hampshire 03824
(603) 868-5576, 9697
(603) 726-8902

PROJECT/TITLE

Demonstration of Non-Aqueous Sewage Disposal System for Recreational and Remote Areas

CITATION

N/A

ABSTRACT/SUMMARY

The overall objective was to demonstrate the feasibility and effectiveness of using a compact, closed-loop, non-aqueous system for collecting, transporting and disposing of domestic waste at remote and recreational areas where conventional methods of disposal are undesirable because of needs to protect recreational and underground waters and in areas where water is in short supply. It will be demonstrated that water conservation is acheived since a non-aqueous flush media will be utilized. The system was demonstrated and evaluated during both winter and summer seasons at a facility serving the recreational and tourist industry. The physical, biological, pathological, chemical and aesthetic characteristics of the flush media was demonstrated. Specific technical data determined and evaluated included: 1) Data on the useful life of the flush media, 2) Per capita waste loading to establish future design criteria, 3) Effectiveness of the incineration process, 4) Operational maintenance and reliability data to project optimum operational techniques and procedures.

STATUS

EPA Publication Pending 670/2-73-088

INFORMATION CONTACT

N/A

TITLE/PROJECT

Fly Ash Filter Aid for Sewage Solids Dewatering and Disposal

CITATION

N/A

ABSTRACT/SUMMARY

The project demonstrated the use of fly ash from a nearby power plant and sludge incinerator ash as filter aids in the pressure filtration of sludges. Pilot plant tests indicated that due to the nature of the sludge from the trickling filter plant other alternate methods of pretreatment would incur severe economic penalties. On the other hand the chemical ingredients in the fly ash and sludge incinerator ash, which are obtained at no cost, permitted adequate dewatering at minimum cost. In addition, the trace minerals in the ashes and the plant food value from the sludge constituted a useable soil conditioner. The City of Cedar Rapids plans to utilize some of this sludge as a soil conditioner and fertilizer in their parks.

STATUS

Project Completed Publication
GPO-EP1.23/2:R 2-73-231 $2.10
NTIS-PB 223-535

INFORMATION CONTACT

N/A

PROJECT/TITLE

Effective Utilization of Municipal and Utility Sludges and Ashes

CITATION

N/A

ABSTRACT/SUMMARY

The object of the project was to: 1) Perform a comprehensive literature review and survey of the present municipal and utility sludge and ash production, disposal methods and utilization methods. 2) Determine technical feasibility and economic practicality of more widespread application of present utilization methods. 3) Suggest new utilization methods with consideration of technical feasibility and economic practicality. A search of the literature and contact with a variety of governmental and trade organizations who are producers and/or present or potential users of sludges and ashes were conducted.

STATUS

Completed Publication is pending.
Characterization and Utilization of Municipal and Utility Sludges and Ashes.
Vol. 1
EPA # 670/2-75-033 a, b, c, & d

INFORMATION CONTACT

N/A

C. Industrial Sludges

PROJECT/TITLE

Reclamation of Metal Values from Metal Finishing Waste Treatment Sludges

CITATION

N/A

ABSTRACT/SUMMARY

The objective of this project was to develop information on sludge volumes and characteristics produced in metal finishing plants, determine the effects of weathering on sludges in current disposal practice, and carry out bench scale investigations on potentially attractive techniques for recovering metals from these sludges. On the basis of the investigation, the process design and economics will be determined for selected metal recovery systems.

STATUS

Publication pending. Report #670/2-75-018

INFORMATION CONTACT

Ray Smithson
Battelle Memorial Institute
Columbus, Ohio
(614) 299-3151 ext. 2342

PROJECT/TITLE

Hardening and Disposal of SO_2 Scrubbing Sludges

CITATION

N/A

ABSTRACT/SUMMARY

This project involves the development of chemicals, methods, and systems for hardening and disposal of fly ash sludges (C_aSO_3 and ($CaSO_4$) resulting from the wet scrubbing of coal fired power boilers with various alkali slurries.

A collection of papers entitled "Flue Gas Desulfurization and Sludge Stabilization" is available through the Library of Congress Catalogue #75-14865. (Dravo Lime Company.) This work contains indirect reference to the impact of sludge on water pollution.

Presently, three systems have been designed and tested. They are highly dependent on conditions(i.e. terrain, space, etc.) and are highly flexible for adaptability. The project is a continuing one.

STATUS

Other symposium papers are available upon request.

INFORMATION CONTACT

J. Selmeczi
Dravo Corporation
#1 Oliver Plaza
Pittsburgh, Pa. 15222

PROJECT/TITLE

A Color Removal and Fibrous Sludge Disposal Process for the Kraft Paper Industry

CITATION

N/A

ABSTRACT/SUMMARY

This publication discusses the development of an economical design and operational data applicable to the Kraft pulp and paper industry in removal of color in mill effluents and in disposal of fibrous sludges. Color removal was accomplished by lime precipitation of the color bodies and fibers with subsequent regeneration of the lime by sludge combustion in a kiln.

STATUS

Project completed. Publication: GPO-#P1.23.2:660/2-74-008 $1.65
NTIS-PB 235573/AS

INFORMATION CONTACT

N/A

PROJECT/TITLE

Solid Waste Disposal

CITATION

Final rept. Phillips, Nacy P.; Wells, R. Murray, Radian Corp., Austin, Tex.

ABSTRACT/SUMMARY

The purpose of the present investigation is to identify available technologies developed in other industries that may be applicable to lime/limestone scrubber sludge disposal. Musch of the technology already developed for phosphate slimes, by-product gypsum, taconite tailings, coal ash, and acid mine drainage sludge is applicable to scrubber sludge disposal. Alternative disposal methods available for scurbber sludge, including deep mine disposal, strip-mined land reclamation, and utilization, possess some degree of potential. Based on presently available data, there are no insurmountable technological problems in disposing of scrubber sludge in an environmentally acceptable manner.

STATUS

Available from: NTIS $7.25/MF $1.45 - Pb-233 144/5

INFORMATION CONTACT

N/A

PROJECT/TITLE

Pilot Scale Treatment of Wine Stillage

CITATION

E. D. Schroeder, California, University of Davis, Ca.

ABSTRACT/SUMMARY

Pilot and laboratory scale studies were run on aerobic and anaerobic biological treatment of winery stillage over a two year period. The pilot scale studies included work with aerobic lagoons and anaerobic packed towers. Laboratory systems studied were aerobic reactors without recycle and batch fed anaerobic process. Because suspended solids removal proved to be a key factor in successful biological treatment, centrifugation, detartration, coagulation and flocculation, and combinations of these methods were included in the studies. Centrifugation proved to be the best method of removing solids prior to biological treatment. Solids removal in combination with an aerobic treatment process can be expected to produce final filtrate chemical oxygen demands of about 700 mg/l and a final filtrate BOD of about 75 mg/l. Anaerobic processes studied did not operate well but produced effluents with chemical oxygen demands of the order of 4000 mg/l

STATUS

Publication Pending #660/2-75-002

INFORMATION CONTACT

EPA Cochrane, M.

PROJECT/TITLE

Interim Report of Task Force on Phosphate Removal Sludges

CITATION

J. B. Farrell, Advanced Waste Treatment Research Laboratory, EPA
Cincinnati, Ohio

ABSTRACT/SUMMARY

Information on dewatering properties of municipal wastewater sludges is scant and poorly organized. A Task Force has collected information on wastewater sludges with particular emphasis on sludge produced when lime, Fe +++, or Al +++ are added for the purpose of P removal to some portion of the wastewater treatment sequence. Data are presented on the thickening and dewatering characteristics of the sludges. Most of the information relates to the mass of sludge produced and its filtering properties. Sludges produced when lime is added to wastewater have greater solids content after settling and dewater of greater mass rates than conventional sludges. However, mass of sludge per volume of wastewater is greatly increased. Considerable information is available on such sludges. Sludges produced when AL +++ or Fe +++ is added the wastewater dewater more poorly than conventional sludges and sludge solids content is less. Sludge mass is greater than in conventional treatment but not as great as would be produced by lime addition. Information is clearly not yet adequate for accuratelypredicting dewatering properties of such sludges. Research studies and field investigation of the dewatering properties of the sludges produced by adding AL +++ and Fe +++ to wastewater are being continued.

STATUS

Publication available - NTIS -PB 238317/AS $7.25

INFORMATION CONTACT

EPA
J. B. Farrell
(513) 684-8265

PROJECT/TITLE

An Experimental High Ash Papermill Sludge Landfill - Report I & II

CITATION

O. B. Andersland, R. F. Vallee, W. A. Charlie, and D. W. Marshall, Michigan State

ABSTRACT/SUMMARY

An experimental papermill sludge landfill was constructed and monitored to obtain engineering information essential to the development of guidelines and recommendations for the design and operation of solid papermill waste landfills. The experimental landfill consisted of two sludge layers with sand drainage blankets on earth dike for lateral confinement and a natural soil cover. The landfill was instrumented for settlement, water pressure, vertical and lateral earth pressure, temperature sludge unit weights, specific gravity, and water contents. Laboratory work was also conducted. A detailed description of the field behavior is given in the report along with predictions based on laboratory results and soil mechanics theory. Sampling of leachate from the sludge landfill at weekly intervals and laboratory analysis accoridng to standard metals for the examination of water and wastewater provided documentation as to leachate composition. A lysimeter study provides information of changes in quality of the leachate when passed through selected natural soils.

The second annual report investigated slope stability by removal of one dike from the sludge landfill. The landfill was excavated to form a 3.4 slope and trimmed to 1.8 slope. Prior to construction, vane shear strength and Dutch cone resistance data were obtained. Slopes indicator and piezometers were installed Laboratory studies and analysis were also conducted. Leachate sampling and analysis documented changes occuring during the project period.

STATUS

Completed. Publication # 670/2-74-076 a&b - NTIS - PB 239869/AS $7.00 (a)
NTIS - PB 239618 $7.50 (b)

INFORMATION CONTACT

EPA - N. B. Schomaker (513) 684-4487

PROJECT/TITLE

Optimization and Design Criteria of An Oil Activated Sludge Concentration Process

CITATION

N/A

ABSTRACT/SUMMARY

Laboratory and pilot plant studies and cost calculations were performed for a new process for the disposal of sewage sludge. The process consists of an oil assisted gravity separation of the majority of the water, followed by multiple effect evaporation to dryness in an oil slurry and incineration of the dry solids.

Secondary sludges are concentrated from about 0.5% up to 5-10% solids. The agreement of performance between laboratory and pilot plant results is good, and no scale-up problems were indicated. The process economics show an advantage of $13-32 a ton compared to the best known commercial technology for a 189 ton/day plant processing a 50/50 mixture of primary plus activated sludges to ash. Optimization of the process can result in greater cost reductions in the thickening and settling steps.

STATUS

Publication Data: GPO-EP 1.23/2:670/2-74-004 $1.40
NTIS - PB 234-173

INFORMATION CONTACT

Exxon Research & Engineering Co.
P.O. Box 8
Linden, New Jersey 07036
(201) 474-0100

PROJECT/TITLE

Sludge Disposal from Sulfur Dioxide and Particulate Removal Processes

CITATION

N/A

ABSTRACT/SUMMARY

Description: A study to summarize and evaluate existing data pertaining to sludge disposal. Investigate the potential methods for improving the characteristics of sludge, and recommend future testing required. The objective of the program is to evaluate the data which is available on sludge disposal and its properties so that a logical test program can be established. The scope of the program is to summarize and evaluate the available data to determine the problem areas, to summarize and evaluate the methods for improving the characteristics of sludge, and to develop a test program for improving the characteristics of sludge. Existing data pertaining to sludge disposal is summarized.

STATUS

The paper study has been completed. A small pilot plant (1,000 lbs per hr) has been built, and produces a leachate from sludge which is being tested on a small scale vegetable farm. Good results have been attained, and trace elements and toxicity studies will be performed. The leachate is being used by fertilizer producers, also. Plant production will be increased to produce 3,000 lbs of fetilizer.

INFORMATION CONTACT

B. McKinney or James Crow
U.S. Tennessee Valley Authority
Chattanooga, Tenn. 37402
(615) 755-3011

D. Miscellaneous

PROJECT/TITLE

Waste Citrus Activated Sludge As a Poultry Feed Ingredient

CITATION

R. H. Jones, J. T. White, and B. L. Damron Winter Garden Citrus Products Corporative Winter Garden, Fl.

ABSTRACT/SUMMARY

The report presents an evaluation of the potential of utilizing waste activated sludge as a poultry feed supplement. The sludge used in this study was obtainted from an activated sludge process treating concentrated citrus waste containing no sanitary wastewater. The sludge was thickened, dewatered and dried using full scale and pilot-scale equipment. The dried sludge was then analyzed for protein, fiber, amino acids, nutrients and moisture. Poultry feeds containing varying concentration of sludge were prepared. Two experiments with boiler chicks, each of three weeks duration, one 8- week broiler study, and six-month laying hen study were conducted to determine the effect of the inclusion of sludge in poultry diets on performance. It is shown in this report that the inclusion of sludge in property formulate diets up to 7.5 percent did not significantly affect poultry performance or meat or egg quality. The value of the sludge was calculated based on the reduction in feed ingredients resulting from the inclusion of sludge. It was found that the value of the recovered sludge significantly reduced the total cost of sludge handling.

STATUS

Publication Pending. EPA #660/2-75-001

INFORMATION CONTACT

N/A

PROJECT/TITLE

Cost-Effectiveness Study for Handling and Disposal of Organic Sludges

CITATION

N/A

ABSTRACT/SUMMARY

The goal of this project is to develop mathematical model for all commonly used processes for sludge handling and disposal and to use these models in an Executive program which will size all processes and estimate the cost of the complete treatment train. Processes being considered are gravity thickening, air flotation thickening, centrifugation, anaerobic digestion, elutriation, aerobic digestion, vacuum filters, sand drying beds, multiple hearth incineration, and transport and disposal to land. A total of 181 ways have been identified to handle and dispose of both primary and waste activated sludge. Computation of the cost of these alternative processes will begin when models for aerobic digestion and land disposal have been completed.

STATUS

Final stage of Preparation for Publication

INFORMATION CONTACT

Richard Eilers or Robert Smith
NERC
5555 Ridge Ave.
Cinn., Ohio 45213
684-2200, 8352

PROJECT/TITLE

Utilization and Disposal of Municipal, Industrial, and Agricultural Processing Wastes on Land

CITATION

N/A

ABSTRACT/SUMMARY

Objective: Determine factors influencing long-term utilization of wastes compatible with sustained agronomic production with emphasis on accumulation of toxic quantities of heavy metals in soils and plants.

Approach: From strip mine spoil areas, surface and core samples to water table depth will be analyzed for total pyrites, sulfides and redox potentials before and after sludge treatments. Results will be used to evaluate effectiveness of sludge in revegetation of strip mine spoils and in abatement of pollution in runoff and leaching waters. Analyses will include ph, SO(4), NO (3), Zn, Cu, Cd, Ni, Co and Pb.

PROGRESS: The field work associated with this project, the Palzo reclamation project, continues to have unavoidable delays. The ongoing research involves laboratory and greenhouse studies. The sulfur fractionation scheme was modified for sludge samples using freeze-dry techniques to remove the water phase. The Palzo strip mine spoil contains about 1.5 to 2.0 percent total sulfur, 52 percent being in the pyrite form. In the sludge about 43 percent of the S is CHCl(3) soluble and mostly in the elemental form. Adding sludge to spoil material increased the pH of the spoil from 3.2 to 5.3 initially but with 70 days of continued aeration the pH's dropped to the original level. Eh values decreased with sludge treatment. Water soluble S increased slightly and pyrite S oxidation decreased with increasing sludge applications. Continuous seration exodized less pyrite material under high sludge rates than under low application rates. High sludge applications expressed Ni and Al absorption by plants.

STATUS

The project will be in progress for another two years.

INFORMATION CONTACT

S. W. Melsted
(217) 333-1000

TITLE/PROJECT

Waste Oil Recycling and Disposal

CITATION

N/A

ABSTRACT/SUMMARY

This publication contains information on the generation, collection and disposal of waste oil. It is a technical evaluation of current refining, and other disposal processes and an assessment (environmental) of the gaseous, liquid and solid wastes discharged from such processes. A feasibility test was conducted in a single metropolitan area for a survey designed to obtain information from service stations, waste oil collectors, and industrial users. The project also sought to obtain a national material balance to determine the ultimate fate of used oils.

STATUS

Project completed. Publication: GPO-EP1.23/2:670/2-74-052 $4.00
NTIS PB 234857/AS $6.50

INFORMATION CONTACT

N/A

Pages 32, 33 and 34 are blank.

TITLE/PROJECT

Industrial Chemicals Solid Waste Generation. The Significance of Process Change, Resource Recovery, and Improved Disposal.

CITATION

Final rept. Saxton, James C.; Kramer, Marc. Arlington, Va.. June, 1974, 155 p.

ABSTRACT/SUMMARY

The study characterizes the process-related solid wastes produced during manufactures of industrial chemicals, Sic group 281. Thirty three chemicals were selected that: possess significant resource value, pose a difficult solid waste disposal problem, and/or have markedly deleterious properties, e.g., toxicity. The selected chemicals composed 40% of 1971 group output and an estimated 95% of the group's solid waste. Fifteen of the chemicals are undergoing process substitutions; in every case the newer process generates less solid waste. Most of wastes are of intrinsically low value, so resource recovery is seldom economic. Inorganics account for over 90% of total disposal cost, due to large waste volume from cre-related processes, such as alumina and phospheric acid. Organics appear to pose little disposal problem. Elimination of water discharge doubles the disposal cost of the 33 chemicals.

STATUS

Available from NTIS Pb-233 46417 pc $5.00/MF $2.25

INFORMATION CONTACT

N/A

PROJECT/TITLE

Elimination of Water Pollution by Recycling Cement Plantdusts

CITATION

N/A

ABSTRACT/SUMMARY

Objectives overall - Elimination of problems associated with disposal of kiln dust from cement plants. Specifically by: 1) Formation of clinker with concomitant violatilization of alkalies. 2) Leaching of water-soluble alkalies and return of leachate to system. 3) Other uses of dust, fertilizer, soil stabilizer, or agricultural limestone. 4) Use of dust as admixture to modify cement or cement products. Present approach - Heat treatment of clay or shale fraction to remove alkalies from a portion of raw feed and/or to remove alkalie from total dust. Fluid bed furnace to remove alkalies at low temperature by control of the furnace atmosphere presently underway.

STATUS

The project is in the final writing stage. It was deemed somewhat successful by the investigators. Water soluble alkalies in cement dust were removed by flame-spraying.

Other phases of the project will continue until maximum results are gained. The project will be funded by private industry upon the exhaustion of governmental funds.

INFORMATION CONTACT

Dr. Miller
Protalnd Cement Association
5420 Old Orchard Rd.,
Skokie, Ill. 60076
(312) 966-6200

PROJECT/TITLE

Study of Solid Waste Management Practices in the Pulp and Paper Industry

CITATION

Final rept. Gorham International, Inc., Maine. Environmental Protection Agency, Rockville, Maryland Solid Waste Management Office, Feb. 74; 198p

ABSTRACT/SUMMARY

This report investigates and identifies present soild waste management practices, present solid waste management practices, examines alternatives, and develops strategies for future pulp and paper industry waste management. It examines waste management in five major segments of the pulp and paper industry; pulp mills, paper mills, paper board mills, and deinking mills. Data is presented on pulp and paper industry solid waste generated since 1960. A case study for each of the five major pulp and paper manufacturing segments is presented.

STATUS

Available from NTIS Pb-234 944/7 $5.50/Mf $2.25

INFORMANTION CONTACT

N/A

TITLE/PROJECT

Effects of Water Pollution Controls on Solid Waste Generation, 1971 to 1985: Executive Summary

CITATION

R. Stone, Ralph Stone and Company, Inc. Los Angeles, California

ABSTRACT/SUMMARY

The effects of air and water pollution controls on solid waste generation were evaluated. The solid wastes from pollution control were identified for individual industrial sectors by their original air or water pollutant constituents, and the treatment process applied. The wastes were categorized by type and by location (rural or urban). Total solid waste from pollution control activities were estimated for 1971 and projected for 1985. Particulates and sulfur oxides were identified as the major air pollutants capable of generating solid wastes when treated; suspended solids and biological oxygen demand were identified as the principle means of estimating the impact of water pollution control on solid wastes.

STATUS

Publication Pending

INFORMATION CONTACT

EPA
Talley, R. J.
(513) 684-4484

PROJECT/TITLE

The Better Whey; A Dilemma

CITATION

Proceedings: Second National Symposium on Food Processing Wastes, Sidney Boxer. U.S. Environmental Protection Agency, Wash., D.C. 3/1971. pp. 409-412.

ABSTRACT/SUMMARY

The cheese industry has the problems of waste whey, a heavy pollutant because of its high BOD and yet a food by-product with excellent nutritive value. Dairy Research and Development Corporation suggests the establishment of regional whey recovery plants to treat the whey from surrounding industries since whey recovery is such an expensive process that small dairy processing plants cannot afford to install the equipment. This research and development outfit has built a demonstration plant at Vernon, New York in cooperation with Dairylea of New York. Whole whey for use as a food or food additive is recovered at this facility by spray drying, the most efficient and economical method discovered by previous research. Laval Separator Company has built the equipment for the demonstration plant. One of the major problems encountered in this project was the conversion of cottage cheese whey, which is more acidic than hard-cheese whey and more difficult to process. (D) (G)

This document is retained in the SWIRS library.

STATUS

N/A

INFORMATION CONTACT

N/A

PROJECT/TITLE

Techniques for Disposal of Wastes from Fruit and Vegetable Processing Plants

CITATION

N/A

ABSTRACT/SUMMARY

Objectives: Evaluate methods for disposing or reducing saline wastes from food processing operations. Develop techniques for utilizing or reducing solid and liquid wastes from food processing plants. Determine whether pesticide residues, if present, can be reduced in or removed from food processing wastes.

Approach: The wastes will be subjected to separation, extraction of various components, dehydration or fermentation, submerged combustion, and other chemical treatments, where applicable. The main commodity wastes will include cucumbers, cabbage and tomatoes.

Progress: Progress has been made in water reuse thereby reducing the total volume for disposal. Solid wastes are high in protein and have no antinutritional factors. Cucumbers cured in recycled brine were as good as or slightly better than those cured in fresh brine. Recycled brine was filtered and used for fresh pack pickles.

The final effluent is disposed of in lagoons. Spray irrigation of the effluent on fields is now being tested.

STATUS

The project is just getting started with initial promising results.

INFORMATION CONTACT

J. R. Geisman
Ohio State U. and Ohio Research & Development Center
20001 Fyffe Court
Columbus, Ohio 43210
(614) 422-5169

PROJECT/TITLE

Seafood Solid Waste in Oregon: Disposal or Recovery

CITATION

Special rept: Kreag, Rebecca; Smith, Frederick J.

ABSTRACT/SUMMARY

The quantity and nature of seafood waste from processing operations are described. Ten alternatives to discharge directly into estuaries are presented. Three methods of disposal were studied for these wastes: incineration, barging off shore and landfill. Landfill appears to be the least costly and the most promising disposal alternative because of the limited quantity of wastes involved. Seven alternatives were considered for recovery of wastes for a marketable product: flesh for human consumption; fish protein concentrate; fishmeal; mink feed; fish food; fertilizer; and chitin for new special products.

STATUS

NTIS $3.00/MF $1.45 COM-74-11245/9

INFORMATION CONTACT

N/A

PROJECT/TITLE

Food Processing Wastes

CITATION

N/A

ABSTRACT/SUMMARY

This project dealt with the wastes generated by Oregon's primary food processing industry, and involved the evaluation of waste occurrence and waste disposal systems currently being used; estimation of the extent and seriousness of present and future problems; establishment of guidelines for the selection of research which could most reasonably help alleviate the critical pollution problems; and implementation of individual research projects involving waste reduction, waste treatment, and by-product development.

The end-of-pipe flows and the discharges from unit operations were monitored for flow, pH, temperature, settleable solids, turbidity, suspended solids, total solids, coliform, total coliform, fecal streptococcus,COD, BOD and chemical concentrations. The results are expressed, where appropriate, as concentrations (e.g., mg U) and in terms of production (e.g., lb/T).

STATUS:

Information and publications may be acquired from the Food Science and Technology Department, Oregon State Univeristy.

Note:

The effluents were tested through spray irrigation methods using "guess amounts" and results of the various concentrations were recorded. Concentration results are listed for each food processing industry.

INFORMATION CONTACT

Mr. Soderquist
Food Science & Technology
Oregon State University
Corvalis, Oregon 97331
(503) 752-1141, 6719

B. Non-processed Wastes - Institutional

PROJECT/TITLE

Annotated Bibliography on Hospital Solid Wastes Collection Treatment and Disposal

CITATION

N/A

ABSTRACT/SUMMARY

The project consisted of compiling an annotated bibliography of the available literature on hospital solid waste collection, treatment, and disposal systems. Literature on microbiological or health aspects related to the various systems is included.

STATUS

The project is completed. Publications may be obtained from EPA (Publication EP #00458-02S1)

INFORMATION CONTACT

Oscar Albrecht, Project Officer
Solid and Hazardous Waste Research Laboratory
National Environmental Research Center
Cincinnati, Ohio 45268

PROJECT/TITLE

Waste Disposal Systems for Cold Regions

CITATION

N/A

ABSTRACT/SUMMARY

The purpose of this project is to develop techniques and criteria for disposal of waste from military facilities, and for predicting, evaluating and controlling the effects of these waste on environmental quality in cold regions.

Major areas of research include treatment of wastewater by application to land as well as management of thermal and solid wastes. Significant aspects of the work with a final report will be issued upon completion of work in each problem area.

STATUS

Continuous project.

INFORMATION CONTACT

Wesley Pietkiewicz
U.S. Army
Cold Regions Research and Engineering Lab.
P. O. Box 282
Hanover, New Hampshire 03755

B. Non-Processed Wastes - Municipal

PROJECT/TITLE

Flyash Disposal

CITATION

N/A

ABSTRACT/SUMMARY

This project involved the disposal of flyash as a slurry in a worked out mine. The resultant mixture of slurry water and mine water were chemically treated before discharge to a stream. This project has been in existence for the past five years and is scheduled to continue for another 5 years.

The dissolved salts in the discharge has dropped from 3000 PPI to 2000 PPI to date. Research is continuing to reduce the salt content to 1500 PPI or lower. The state of Penn. treats the discharge as a process rather than a mine effluent. The present PPI would be allowable if the discharge was treated as mine drainage. However, the mechanism is working well, and research will continue.

STATUS

Ongoing Project. Information will be sent upon request.

INFORMATION CONTACT

Mr. Robert O'Hare
Mr. Nelson Tonet
Duquesne Light Company
435 6th Avenue
Pittsburgh, Pa. 15219

PROJECT/TITLE

Management of Forested Watershed for Water Yield Production and Wastewater Disposal - W. E. Sopper

CITATION

N/A

ABSTRACT/SUMMARY

The objectives of this study were: 1) To investigate the effects of watershed management techniques on the quantity and quality of water yield form small forested watersheds, 2) To investigate the hydrologic behavior and response of a 20 acre forested drainage basin to selected rainfall events applied with an artificial rainfall facility, and 3) To investigate the potential use of forests as disposal sites for treated municipal wastewater and sludge.

STATUS:

Completed. Publication: Conference on Recycling Treated
Municipal Wastewater Through Forest & Cropland

GPO-EP 1.23/2 660/2-74-003 $1.20
NTIS-PB 236313/AS

INFORMATION CONTACT

N/A

PROJECT/TITLE

Fly Ash Filter Aid for Sewage Solids Dewatering and Disposal

CITATION

N/A

ABSTRACT/SUMMARY

The project demonstrated the use of fly ash from a nearby power plant and sludge incinerator ash as filter aids in the pressure filtration of sludges. Pilot plant tests indicated that due to the nature of the sludge from the trickling filter plant other alternate methods of pretreatment would incur severe economic penalties. On the other hand the chemical ingredients in the fly ash and sludge incinerator ash, which were obtained at no cost, permitted adequate dewatering at minimum cost. In addition, the trace minerals in the ashes and the plant food value from the sludge constituted a useable soil conditioner. The City of Cedar Rapids plans to utilize some of this sludge as a soil conditioner and fertilizer in their parks.

STATUS

Project completed. Publication: GPO-EP1.23/2:R2-73-231 $2.10
NTIS-PB 223-535

INFORMATION CONTACT

N/A

PROJECT/TITLE

Potential Solid Waste Generation and Disposal from Lime and Limestone Desulfurization Processes. R. J. Evan - Author

CITATION

N/A

ABSTRACT/SUMMARY

The generation and disposal of solid waste from electric utility plants using a lime/limestone wet-scrubbing system and the potential effects on the environment were estimated for 1975 and 1980. The study indicated that in 1975 approximately 5.8 million tons of desulfurization solid waste (50 percent solids) will be generated. In 1980, when it is estimated that desulfurization will become commercially accepted, approximately 71.4 million tons of this material will be generated for disposal and/or utilization. The desulfurization waste material, when combined with lime, fly ash, and water, may have potential for use as a roadbase material, landfill reclamation, and synthetic aggregate.

STATUS

Publication $2.25 - NTIS PB-233 975/2

INFORMATION CONTACT

N/A

PROJECT/TITLE

Criteria for Site Selection and Operation of Sanitary Landfills

CITATION

N/A

ABSTRACT/SUMMARY

The objective of the project is to determine the authority needed to acquire land for and operate sanitary landfills; identify and evaluate powers of local governmental units and limitation of those powers to adopt and enforce land-use restrictions and regulations as they relate to sanitary landfills, and other restrictions such as environmental protection standards that affect site location; identify reasons for and extent of institutional arrangements needed for solid-waste management on an areawide basis.

State enabling legislation, administrative rules, regulations and guidelines, local ordinances, and judicial decisions applicable to site acquisition, location restrictions, landfill operations, and funding requirements were collected for most of the North Central States and analyzed. A questionaire was used in an endeavor to ascertain the reasons for and extent of opposition to location sanitary landfills in rural residential areas.

STATUS

This is an extensive project and is only half completed. Results and findings to date are discussed in the following publications.

1. North Dakota Law Review, "Solid Waste Management in North Dakota", Vol 49, #3, Spring 1973, pp. 499-535
2. Public Works, Vol 104, #3, 3/73
   Public Works, Vol 104, #4, 4/74
3. Municipal Waste-Research Needs Related to the Institutional and Legal Aspects of Recycling Municipal Waste On The Land:Research on Land & Water Resources. Proceeding: Residential Needs Related To Recycling Urban Wastewater on Land. Penn. State University publication.
4. Managing Solid Waste "A Focus on Indiana Law Economics Research Service, U.S.D.A. publication

INFORMATION CONTACT

Dean T. Massey
U. of Wisconsin
U.S.D.A. Natural Resources/Economic Division
Madison, Wisconsin 53706
(608) 262-3568

PROJECT/TITLE

Hydrogeology of Solid Waste Disposal Sites in Northeastern Illinois

CITATION

Final rept. 1 Jun 66-31;May 68 - Hughes, G. M.; Landon, R. A.; Farvolden, R. N.

ABSTRACT/SUMMARY

The study attacks one of the problems inherent in disposing of refuse on land; the ever-present danger that-unless properly engineered in a sanitary landfill--the wastes will adversely effect ground-water resources. Hydrogeologic, and water quality studies of five landfills in northeastern Illinois were carried out. The distribution and concentration of dissolved solids in the vicinity of four of these landfills was found to be controlled by the configuration of the ground-water flow system. The major factors influencing the attenuation of the dissolved solids appear to be the particle size of the earth materials through which they move and the distance that they move.

STATUS

GPO/Mf $.095 - NTIS Pb-214 028/3

INFORMATION CONTACT

N/A

PROJECT/TITLE

Sanitary Landfill Technology

CITATION

Weiss, S. Los Angeles County study. In Sanitary landfill technology. Park Ridge, New Jersey, Moyes Data Corporation, 1974. p.252-269

ABSTRACT/SUMMARY

A study conducted by the County of Los Angeles, California, to formulate construction criteria for sanitary landfills and improvements which would lead to optimum land development and use is reported. Methods utilized in the study are described. Monitoring and prediting subsidence and compaction of landfill, gas movement and control, and groundwater pollution from sanitary landfills are discussed. Criteria for the location, design, construction, inspection, supervision, and maintenance of sanitary landfills; for the uses of land on or adjacent to sanitary landfills; and for the development, construction, and maintenance of improvements to sanitary landfills established as a result of this study are discussed.

STATUS

SWIRS library

INFORMATION CONTACT

N/A

PROJECT/TITLE

Water-Quality of Selected Solid-Waste Disposal Sites, Suffolk County, Long Island, New York

CITATION

Preliminary Findings of a Leachate Study on Two Landfills in Suffolk County, New York. By Grant E. Kimmel and Olin C. Braids. Journal of Research, U.S. Geological Survey, Vol.3 , No. 3, May-June 1975, p. 273-280

ABSTRACT/SUMMARY

In anticipation of the expected population growth in the county, water planning and management agencies feel the need for regulation in the operation of solid-waste-disposal sites and in the selection of new sites, so as to prevent unreasonable or unnecessary deterioration of the quality of the ground water or of the environment. In drafting regulations, information is needed with regard to the character of the leachate and chemical reactions that may occur in the zones of aeration and saturation. In this respect information was needed on incinerated solid waste as well as the general variety of solid wastes.

The major objectives of this project were to (a) document the nature and extent of changes in the chemical quality of the ground water associated with solid-waste disposal at one or more selected sites, and (b) apply existing modeling techniques to predict the nature and rate of change (both as a function of time and space) of the chemical quality of the ground water. To the extent possible, modeling efforts involved the zone of aeration and the zone of saturation.

STATUS

N/A

INFORMATION CONTACT

Dale Mosher - EPA/SWM
1835 K Street, N.W. AW/564
Washington, D.C.

PROJECT/TITLE

Evaluation of a Solid-Waste Disposal Site

CITATION

N/A

ABSTRACT/SUMMARY

Cortland County has proposed at landfill operation for disposal of solid-wastes in the near future. Substantial base line geologic and hydrologic data on the proposed site has been collected, and an array of 50 shallow wells has been emplaced and monitored on a weekly basis since April, 1973.

The primary objectives of this study are: (1) to determine in more detail the hydrologic regime of the landfill site and existent water quality, and (2) to evaluate the effect of landfill operations on this regime over an extended period of time.

The proposed study is particularly significant because considerable geologic and hydrologic parameters can be determined and monitored prior to landfill operation. Continuation of this study after initiation of landfill operations are expected to provide a critical evaluation of the sanitary landfill as a viable means of solid-waste disposal.

The proposed study basically involves the establishment and maintenance of a monitoring program for critical weather, hydrologic, and geologic parameters. Data thus obtained will determine the impact of landfill operations on the natural hydrogeologic environment of this area and adjacent parts of New York and Pennsylvania.

STATUS

Continuing Project.
Articles and publication are available upon request

INFORMATION CONTACT

Dr. T. E. Bugh
State University of New York - School of Arts
Cortland, New York 13045

PROJECT/TITLE

Thermophilic Aerobic Digestion of Organic Solid Wastes
(Andrews, John F., Kambhu, Kawi)

CITATION

N/A

ABSTRACT/SUMMARY

The major reactions involved in the process of thermophilic aerobic digestion are presented, discussed, and simplified into the basic stoichimetric, thermochemical, kinetic relationships. A simple procedure is presented for determining the thermochemistry of the net reaction by relating heat production to the oxygen equivalent or C.O.D. of the organic solids.

The simulation studies and mathematical model discussed employ conservative values of biological parameters. The mathematical model provides assistance in planning and conducting pilot plant studies.

STATUS

Final Report. - NTIS $6.25/MF $1.45
PB 222 396

INFORMATION CONTACT

Clemson University
S. C. Dept. of Environmental System Engineering

TITLE/PROJECT

Feasibility of Using Forest Land for Sludge Disposal

CITATION

N/A

ABSTRACT/SUMMARY

This project is investigating the feasibility of using forest ecosystems to absorb nutrient additions in the form of sewage sludge. This research is important to the current problem of water pollution caused by nutrients leaching from sludge disposed of either by dumping at landfill sites or by other means that do not incorporate recycling or nutrient removal.

STATUS

Sludge from a nearby municipality and from recreation complexes in the White Mountain National Forest was landspread in June, 1975. Preliminary studies have been completed, but impact (environmental) work has just started. The project is scheduled to be completed by next summer (1976)

INFORMATION CONTACT

J. M. Hornbeck
University of New Hampshire Graduate School
Durham, New Hampshire 03824
(603) 868-5576, 9697
(603) 726-8902

PROJECT/TITLE

Demonstration of Non-Aqueous Sewage Disposal System for Recreational and Remote Areas

CITATION

N/A

ABSTRACT/SUMMARY

The overall objective was to demonstrate the feasibility and effectiveness of using a compact, closed-loop, non-aqueous system for collecting, transporting and disposing of domestic waste at remote and recreational areas where conventional methods of disposal are undesirable because of needs to protect recreational and underground waters and in areas where water is in short supply. It will be demonstrated that water conservation is acheived since a non-aqueous flush media will be utilized. The system was demonstrated and evaluated during both winter and summer seasons at a facility serving the recreational and tourist industry. The physical, biological, pathological, chemical and aesthetic characteristics of the flush media was demonstrated. Specific technical data determined and evaluated included: 1) Data on the useful life of the flush media, 2) Per capita waste loading to establish future design criteria, 3) Effectiveness of the incineration process, 4) Operational maintenance and reliability data to project optimum operational techniques and procedures.

STATUS

EPA Publication Pending 670/2-73-088

INFORMATION CONTACT

N/A

PROJECT/TITLE

Relationship between Topographic Position and Contamination of Water Resources by Refuse Landfills

CITATION

N/A

ABSTRACT/SUMMARY

The proposed research was based on the hypothesis that contamination characteristics of ground and surface water, caused by refuse landfills, are related to the topographic position of the refuse site. Refuse sites are located on upland and valley surfaces. Landfills may be located in the upland or loess or glacial till and in valleys, may be located on floodplains, valley walls, or in gully positions. Refuse landfills representative of the various landscape positions and representative of different ages will be stuided. Geophysical methods will be used to locate contaminated water boundaries and fill geometry. At each site bore holes were drilled, and water samples collected from them and from the adjacent stream during low flow condition. A major goal of the research was to relate topographic position with rate and direction of leachate movement and chemical characteristics of the contaminated ground and surface water. By relating these factors to landscape position characteristics of existing and potential sites can be evaluated and regulated for public safety.

STATUS

Completed. Several papers have been published in the journal Groundwater.

INFORMATION CONTACT

L. V. Sendlein
(515) 294-7814
R. C. Palmquist
(515) 294-7814

PROJECT/TITLE

Survival and Movement of Viruses in Landfilled Solid Waste

CITATION

N/A

ABSTRACT/SUMMARY

The objectives of this project are to determine the survival patterns of viral pathogens in landfilled solid waste and to evaluate the potential contamination of water resources through leaching of viruses from a waste disposal site . Microbiologic monitoring leachates from Cells #1 and #2 is being conducted in order to determine the degree of health hazard involved in solid waste disposal by landfilling. The results so far indicate that poliovirus may survive in compacted solid waste for at least 13 days at temperatures of 68-80 degrees F but the virus is inactivated in 2-4 days in a landfill with temperatures ranging from about 120-140 degrees F.

STATUS

Project was completed. Final report has been wirtten and is awaiting EPA review and publication.

INFORMATION CONTACT

Merzda Peterson
Research Triangle Park
Durham, North Carolina

PROJECT/TITLE

Effective Utilization of Municipal and Utility Sludges and Ashes

CITATION

N/A

ABSTRACT/SUMMARY

The object of the project was to: 1) Perform a comprehensive literature review and survey of the present municipal and utility sludge and ash production, disposal methods and utilization methods. 2) Determine technical feasibility and economic practicality of more widespread application of present utilization methods. 3) Suggest new utilization methods with consideration of technical feasibility and economic practicality. A search of the literature and contact with a variety of governmental and trade organizations who are producers and/or present or potential users of sludges and ashes was conducted.

STATUS

Completed. Publication is pending. - Characterization and Utilization of Municipal and Utility Sludges and Ashes. Vol. 1

EPA #670/2-75-033 a,b,c, & d

INFORMATION CONTACT

N/A

C. Agricultural

PROJECT/TITLE

Demonstration of Facilities for the Treatment and Ultimate Disposal of Cattle Feedlot Wastes-Ultimate Disposal of Cattle Feedlot Wastes

CITATION

N/A

ABSTRACT/SUMMARY

Objectives of the project are: 1) To determine the effects of feedlot runoff and manure loading rates on the chemical and physical properties of soil, on the quality of runoff from the disposal area and on corn forage yields. 2) To determine the most economical loading of feedlot wastes onto land compatible with pollution control. 3) To determine the concentration of diethylstilbesterol residue in feedlot wastes and its movement through the soil profile beneath the waste disposal area.

STATUS

Project will be continuing for approximatley 6 months. Several publications are available upon request.

INFORMATION CONTACT

H. L. Manges
Kansas State University
School of Engineering/Anderson Hall
Manhattan, Kansas 66502
(913) 532-5580

PROJECT/TITLE

Pollution Control Systems for Beef Cattle and Sheep

CITATION

N/A

ABSTRACT/SUMMARY

The objective of this project is the abatement of pollution through improved systems for controlling beef cattle and sheep waste. Systems for managing wastes from housed and feedlot beef cattle and sheep will be developed and evaluated for economic abatement of air, water and soil pollution. Permanent effluent land irrigation installations will be designed for disposal or utilization runoff from a beef feedlot holding pond to complete a total feedlot runoff control system. Attention will be given to developing improved handling systems for managing the solid waste. Units will be managed, tested and improved as necessary for system optimization. The components of collection, treatment, transport and disposal will be included in the design systems. Disposal of treated effluent to land will be investigated to develop application rates for optimum crop use.

STATUS

Project is still in progress.

INFORMATION CONTACT

Conray B. Gilbertson
U.S.D.A. Meat Animal Research Center
Clay Center, Nebraska 68933
FTS 402 475-3669
(402) 472-2824

PROJECT/TITLE

Evaluation of Components and Systems for Handling Waste From Housed Swine

CITATION

N/A

ABSTRACT/SUMMARY

The objective of this project is to reduce the pollution potential of housed swine through improved waste systems. Alternative methods of collection, treatment, transport and disposal of waste from housed swine will be developed and evaluated as component parts of a total system for economic reduction of the pollution potential of waste from all phases of swine production. Major components of systems will be evaluated, improved, and combined for development of optimum total systems. Evaluations will be based on labor, initial and operating costs, effects on livestock production, and degree of control over pollution of air, waste and soil.

STATUS

Project is still in progress

INFORMATION/CONTACT

Conray B. Gilbertson
U.S.D.A. Meat Animal Research Center
Clay Center, Nebraska 68933
FTS 402 475-3669
(420) 472 2874

PROJECT/TITLE

Automated System for Water Pollution Control from an Animal Production Unit

CITATION

N/A

ABSTRACT/SUMMARY

The specific aims of the project were: 1. To continue to monitor with weekly sampling and laboratory analyses the overall performance characteristics of the plant. 2. To install, test and evaluate the performance of the aerobic digester equipment to be provided by DeLaval Comapny, or if not by them, to purchase and build a surface aerator for installation in the aerobic digester. 3. Surface aerator; submergence and speed variation in rotor; turbidity improvement of the effluent with the use of coagulants; evaluation of chlorine disinfection of the recycled effluent. 4. To automate the disposal of solids onto the nearby farm land with the use of automatically operated irrigation system. 5. To establish some monitoring stations for sampling and analyzing the water from the Loramie Creek that receives the drainage from the research farm of the Botkins Grain and Feed Company. 6. Develop an economic model of the plant to evaluate ways of making the system economically feasible.

STATUS

Completed.

The project was monitored for 3 yrs., and is reputedly the longest study of a project of this type. The report is well documented. The findings were presented in April, 1975 at a conference.

The report has been cleared for publication and is awaiting printing by EPA.

INFORMATION/CONTACT

Dr. EP Taiganides
Agricultural Engineering
614-422-6626
Ohio State University
School of Agriculture

190 N. Oval Dr., 102 Administration Bldg.
Columbus, Ohio 43210

D. Mining

PROJECT/TITLE

Sulfur Application for Land Pollution Abatement

CITATION

N/A

ABSTRACT/SUMMARY

The purpose of the project is to investigate methods for using sulfur to stabilize tailing piles to assure long-term resistance to weathering and to determine the applicability of sulfur for constructing impervious ground cover bases for sanitary landfill, leach dumps, and mill ponds.

The project is an ongoing one and has been in progress for over 14 years. The project is also aimed at cutting back on wind erosion by spray coating to hold down various materials and prevent it from blowing away. Unusual success with uranium mill tailings has been demonstrated. Spray coating has played a very significant part in holding back radon gas.

STATUS

Ongoing project. Contact will research back for information pertaining to other projects that impact upon ground and surface water upon request.

INFORMATION/CONTACT

Donald G. Kesterke or Wm. McBee
U.S. Dept. of the Interior
Bureau of Mines - 500 Date Street
Boulder City, Nevada 89005

PROJECT/TITLE

Lake Hope Drainage Demonstration Project

CITATION

N/A

ABSTRACT/SUMMARY

Description: The purpose of the Lake Hope project is to demonstrate the reduction of acid mine drainage pollution by the removal of coal refuse, and the construction of bulkhead seals to flood underground mine workings and thus prevent the formation of acid. The Lake Hope site was chosen for the demonstration project because acidic drainage from abandoned coal mines in the watershed above Lake Hope has severely restricted waste oriented activity in this prime recreational area. A total of 107 mine openings has been noted. The combined acid discharge from these openings is over 700,000 pounds per year. A multiphase mine drainage abatement demonstration program is recommended with major elements including: Removal and/or burial of coal refuse which was scattered throughout the area during active mining operations; sealing of about 50 mine openings.

STATUS

Several standard bulkheads, and one innovative, but not new, bulkhead were used. The dirt was stripped from the hillside at the site of the mine openings. A clay dam was constructed and the stripped dirt was used to re-cover the hillside, thus sealing in the acid mine leakage. It is expected that before the end of 1975, the engineering design phase will be completed. Fifty mines have been cleared of coal refuse and sealed to date.

A feasibility study is pending publication. EPA-R2-73-151 Lake Hope Drainage Demonstration Project.

INFORMATION/CONTACT

WC Roman
Division of Planning
Fountain Sq. 43224
(614) 466-2333

PROJECT/TITLE

West Shade River Abatement Demonstration Project

CITATION

N/A

ABSTRACT/SUMMARY

The concepts of sand abatement, strip-mine reclamation and mine-acid control are the objectives of the project. The demonstration project will seek to how the use of sludge, fertilizing, liming and other minor techniques will permit the growth and self-regeneration of various grasses, shrubs and trees.

The demonstration project is being conducted in Meigs County, Ohio, which is a part of Appalachia. Severe erosion problems occurring in certain strip-mine areas can be eliminated or controlled utilizing methods and materials which have been researched. Sand erosion from high walls and spoil banks causes considerable property loss due to the deposition of sand over once-tillable soils and the clogging of existing waterways.

One of the problems encountered in this project is the distance from which the sludge had to be transported. The transportation of sludge from the waste treatment facility to the Appalachian hills is expensive.

STATUS

A final report is pending.

INFORMATION/CONTACT

Appalachian Regional Commission or

C. Meir
State Department of Natural Resources
Columbus, Ohio 43212
(614) 466-3066

PROJECT/TITLE

Survival and Movement of Viruses in Landfilled Solid Waste

CITATION

N/A

ABSTRACT/SUMMARY

The objectives of this project are to determine the survival patterns of viral pathogens in landfilled solid waste and to evaluate the potential contamination of water resources through leaching of viruses from a waste disposal site . Microbiologic monitoring leachates from Cells #1 and #2 is being conducted in order to determine the degree of health hazard involved in solid waste disposal by landfilling. The results so far indicate that poliovirus may survive in compacted solid waste for at least 13 days at temperatures of 68-80 degrees F but the virus is inactivated in 2-4 days in a landfill with temperatures ranging from about 120-140 degrees F.

STATUS

Project was completed. Final report has been wirtten and is awaiting EPA review and publication.

INFORMATION CONTACT

Merzda Peterson
Research Triangle Park
Durham, North Carolina

Pages 68, 69 and 70 are blank.

PROJECT/TITLE

Relationship between Topographic Position and Contamination of Water Resources by Refuse Landfills

CITATION

N/A

ABSTRACT/SUMMARY

The proposed research was based on the hypothesis that contamination characteristics of ground and surface water, caused by refuse landfills, are related to the topographic position of the refuse site. Refuse sites are located on upland and valley surfaces. Landfills may be located in the upland or loess or glacial till and in valleys, may be located on floodplains, valley walls, or in gully positions. Refuse landfills representative of the various landscape positions and representative of different ages will be studied. Geophysical methods will be used to locate contaminated water boundaries and fill geometry. At each site bore holes were drilled, and water samples collected from them and from the adjacent stream during low flow condition. A major goal of the research was to relate topographic position with rate and direction of leachate movement and chemical characteristics of the contaminated ground and surface water. By relating these factors to landscape position characteristics of existing and potential sites can be evaluated and regulated for public safety.

STATUS

Completed. Several papers have been published in the journal Groundwater.

INFORMATION CONTACT

L. V. Sendlein
(515) 294-7814
R. C. Palmquist
(515) 294-7814

PROJECT/TITLE

Investigation and Monitoring of Landfill Sites in Marion County, Ind.

CITATION

N/A

ABSTRACT/SUMMARY

This project was initiated as a result of the concern about ground water and surface water pollution originati at landfill sites in Marion County, Ind. Seven landfills were monitored and the results recorded (inorganic analyses, metal concentration, etc). The project will be continued on a more detailed basis. The monitoring wells were used to gather data to define the geology and the three dimensional ground-water flow system and provided extensive water-quality information relative to this flow.

STATUS

The project has been completed and is now in the review stage.

INFORMATION/CONTACT

Bill Shampine or Robert Pettijohn
U.S. Geological Survey
1819 North Meridan St.
Indianapolis, Ind. 46202
(317) 269-7101

PROJECT/TITLE

Snow Accumulation form Snow-Fence Experiments in Solid Waste Disposal Site Design

CITATION

N/A

ABSTRACT/SUMMARY

In 1974 a study was initiated to determine if it was possilbe to decrease the amount of snow held in solid waste disposal sites as one means of decreasing solid water moisture in the spring and early summer. The initial study involves the use of artificial barriers to induce additional accumulation of drifting snow away from the waste disposal site. If this additional snow were not held in the catchment area, it could add to the general infiltration in the waste disposal area.

Several working assumptions are used in the study; (1) drifting snow accumulates to significant depth only in places that are protected from the wind; (2) snow fills most terrain depressions before the end of winter, and once full, these areas are aerodynamically smooth and trap little additional snow; (3) artificial barriers of modest height combined with terrain features could increase the trapping efficiency of the natural terrain; (4) additional snow held in the catchment area could result in less snow accumulation and spring infiltration in the waste disposal site.

Two snow fields were selected for study. These were located in a large basin on the western side of a ridge in the town of Solon. It is expected that snow depth will increase close behind the fences but will decrease farther down-wind with no net increase in the amount of snow caught.

STATUS

The project is an ongoing one. Articles are available upon request.

INFORMATION/CONTACT

Dr. Je Bugh
State University of New York
Graduate School
Cortland, New York 13045
(607)753-4214

PROJECT/TITLE

Hydrogelogic Considerations in the Siting and Design of Landfills in Kentucky

CITATION

N/A

ABSTRACT/SUMMARY

The objectives of the project were to describe the geologic and hydrologic properties that should be used as a guide in selection of solid waste disposal sites. To select and describe geologic environments in Kentucky that would be suitable or unsuitable for solid waste disposal.

Knowledge of these properties is of value, not only for proper operation of the site, but also in reducing the pollution hazard to surface and ground-water in the area. The general delineation of geologic environments potentially suitable or unsuitable for refuse disposal in the state would provide information needed by state agencies involved in selection and approval of solid waste disposal sites.

STATUS

The project has been completed and is in review presently. The data can be used as a guide in the selection of solid waste disposal sites in other areas in the U.S. The transfer value is extremely good.

INFORMATION/CONTACT

H.H. ZEHNER Water Resources Division
U.S. Department of the Interior
Geological Survey
Louisville, Kentucky 40202
(502) 582-5241

PROJECT/TITLE

Demonstration of Non-Aqueous Sewage Disposal System for Recreational and Remote Areas

CITATION

N/A

ABSTRACT/SUMMARY

The overall objective was to demonstrate the feasibility and effectiveness of using a compact, closed-loop, non-aqueous system for collecting, transporting and disposing of domestic waste at remote and recreational areas where conventional methods of disposal are undesirable because of needs to protect recreational and underground waters and in areas where water is in short supply. It will be demonstrated that water conservation is acheived since a non-aqueous flush media will be utilized. The system was demonstrated and evaluated during both winter and summer seasons at a facility serving the recreational and tourist industry. The physical, biological, pathological, chemical and aesthetic characteristics of the flush media was demonstrated. Specific technical data determined and evaluated included: 1) Data on the useful life of the flush media, 2) Per capita waste loading to establish future design criteria, 3) Effectiveness of the incineration process, 4) Operational maintenance and reliability data to project optimum operational techniques and procedures.

STATUS

EPA Publication Pending 670/2-73-088

INFORMATION CONTACT

N/A

PROJECT/TITLE

Economic Analysis of Land-Intensive Wastewater Systems

CITATION

N/A

ABSTRACT/SUMMARY

The 1972 Water Pollution Control Act Amendments are requiring increased treatment of municipal wastewaters. One method to obtain a high quality effluent at relatively low cost compared to other techniques is land treatment.

This study compares and evaluates conventional in-plant treatment and land treatment in a cost framework and in a production efficiency framework. The major objective is to explain why more municiplaities have not chosen land treatment in the past.

STATUS

Publication available.

Publication: Water Resources Research Institute of the University of N. Carolina
UNC-WRRI-74-98 $4.00

Title: Economic Analysis of Land Treatment of Municipal Wastewaters - G. A. Carlson
Article: Water Resources Journal (Date 1975)

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Water Renovation of Municipal Effluents by Reverse Osmosis

CITATION

J. E. Cruver, J. E. Beckman, and Bevege, Gulf Environmental Systems Company San Diego, Ca.

ABSTRACT/SUMMARY

The purpose of the work performed under this contract has been to obtain reverse osmosis operating data on primary and secondary effluents with varying degrees of pretreatment. Field tests were conducted at the Pomona Water Renovation Plant of the County Sanitation Districts of Los Angeles. Two parallel reverse osmosis systems were operated with spiral wound membrane modules. It was concluded that spiral wound reverse osmosis units can be economically operated on primary and activated sludge effluents with only moderate pretreatment and periodic chemical cleaning. Activated-carbon pretreatment was shown to be unnecessary for successful operation on sand filtered activated sludge or chemically clarified and sand filtered primary effluent. A simplified economic analysis indicated that reverse osmosis treatment costs are favorable and that the process merits serious consideration in a planned water supply and waste management program.

STATUS

Publication Pending

INFORMATION/CONTACT

EPA
Bostian, H.
513-684-8358

PROJECT/TITLE

Reverse Osmosis of Treated and Untreated Secondary Sewage Effluent;
Apendix A-2 and Appendix A-6

CITATION

D. F. Boen, and G. L. Johannsen, Eastern Municipal

ABSTRACT/SUMMARY

The two appendices in this volume complete report "Reverse Osmois of Treated and Untreated Secondary Sewage Effluent" EPA 670/2-24-077; the following abstract is that for the main volume. A pilot study was conducted to determine reverse osmosis feasibility on untreated and treated secondary effluents. Six commercially designed reverse osmosis pilot units, with 3,000 to 10,000 GPO nominal capacilities and different module concepts, were tested. Post treatment of secondary effluent feeds, using alum clarification sand filtration, granular activated carbon treatment, chlorine additions and pH adjustment, in different combination improves reverse osmosis performance and significantly extends useful membrane rejuvenation treatments. Inorganic fouling (particularly with phosphate) could be removed with solution of the sodium salt of ethylenediaminetetraacetic acid. Of the module concepts tested, one of the tabular makes and the spiral wound had the best overall costs, excluding brine disposal, is estimated to be $0.73/1,000 gallons for 9 MGD product water facility.

STATUS

Publication available.

Main Volume: Reverse Osmosis of Treated & Untreated Secondary Sewage
Effluent D. F. Boen

GPO-EP1.23/2:670/2-74-077 Price Pending
NTIS-PB 239353/AS $7.50

Appendix A-2 & A-6
NTIS-PB 239 354/AS $3.75

INFORMATION CONTACT

Stern G. 513-684-8276

PROJECT/TITLE

Improved Waste-Treatment System Design Based on the Natural Thermal Environment

CITATION

N/A

ABSTRACT/SUMMARY

Low-maintenance, technology-simple (LMTS) waste treatment systems (systems having minimal dependence on electrical and mechanical equipment) offer an attractive alternative to technology-intensive, package plants currently being used to treat wastewaters from subdivisions and isolated recreational areas. Although package plants are advertised to perform satisfactorily with a minimum of operational control, experience has shown that they are subject to serious operational and performance problems.

The objective of the proposed research is to establish procedures with which the engineer can make a rational design of a LMTS waste treatment system based on (1) easily obtained meteorological data and (2) effluent standards applicable to the location of the system. This objective will be achieved by: 1. the definition and formulation of the time-varying thermal characteristics of that portion of the earth's surface extending from the surface to a depth of approximately 10 meters, 2. the characterization of domestic wastewater temperatures, 3. the application of recent research related to temperature effects on biological processes to the design of LMTS treatment units, and 4. the evaluation of the predicted characteristics of these units in light of current and anticipated effluent standards.

STATUS

The project is a 2 yr. project. The investigators have just completed one year and have designed a biological process sensitive to temperature.

INFORMATION/CONTACT

Dr. L. G. Rich
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Rhodes Research Building
Clemson, South Carolina 29631
803-656-3201 ext. 3276

PROJECT/TITLE

Effects of Spray Irrigation of Municipal Wastewater on the Rate and Total Accumulation of Heavy Metals

CITATION

N/A

ABSTRACT/SUMMARY

The specific objective of this project was to determine the total amount and rate of accumulation of selected heavy metals in several soil-vegetation ecosystems which were spray irrigated with treated municipal sewage effluent and sludge for twelve years. The proposed study was conducted at the Wastewater Renovation and Conservation Project Facility on the Pennsylvania State University farm where experimental plots were spray irrigated with various amounts and combinations of treated municipal sewage effluent and liquid digested sludge. The soil and vegetation in each area was sampled for analyses of selected heavy metals to determine the amount and rate of accumulation and to correlate these results with the application rates and vegetation cover types. Soil and foliar samples from previous years were analyzed.

STATUS

Completed.

Publication: Renovation of Secondary Effluent For Re-Use As A Water Resource
GPO-EP1.23/2:660/2-74-016 $4.80
NTIS-PB 234176

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Using Cropland for Sewage Wastewater and Sludge Disposal. W. E. Sooper

CITATION

N/A

ABSTRACT/SUMMARY

The objective was to determine the interaction of soils and plants with sewage wastewater and sludge disposed on cropland and forestland, with emphasis on P, boron, and N reactions in the soil and with the biosphere and on the soils potential for removing N from waste by removing denitrification; develop systems for land disposal of wastewater and sludge.

Hydrologic effects such as perched water tables, interflow and runoff were measured.

STATUS

Completed.

Publication: Conference on Recycling Treated Wastewater Through Forest and Cropland

GPO-EP1.23/2:660/2-74-003 $1.20
NTIS-PB 236313/AS

INFORMATION/CONTACT

N/A

PROJECT/TITLE

The Role of Sewage Effluent and Sludge in the Introduction of Mercury Into Marine and Agricultural Ecosystems

CITATION

N/A

ABSTRACT/SUMMARY

The proposed work will 1) determine the significance of mecury input into the estuarine environment by effluent and sludge disposal, 2) determine and explain the variations in mercury concentration observed in sewage treatment plants, 3) determine the input of mercury to the marine system by rain and runoff, 4) continue studies on the distribution of mercury in the local (Carteret County, North Carolina) estuaries comparing a system receiving effluent (Calico Creek, Morehead City, North Carolina) with a variety of less affected areas, 5) determine the rate of mercury accumulation in marine organisms which are fed on sewage sludge, 6) determine the rate of uptake of mercury by vegetables which are grown in soil enriched with sewage sludge. Coldvapor atomic absorpiton analysis of mercury will be used.

STATUS

The project is partially finished, and the investigators state that they have a pretty clear picture of the impact of mercury in the estuarine environment. Studies are being conducted at a small town Moorehead City treatment plant (15,000 pop.). Study has shown a very distinct pattern of mercury distribution in estuaries and animals. The distribution of mercury is very restricted in distance. It remains very close to the outfall of the sewage treatment plants.

A town of comparable size and adjacent to Moorehead has one half to one third less mercury in its effluent and sludge. There are no industrial sources in either town. It is presently theorized that the mercury contamination may have come from the use of house paints containing mercury. Fungi are a problem in the area and mercury was used as an inhibitor at one time. The contamination may be resulting from storm water runoff.

INFORMATION/CONTACT

Dr. R. T. Barber
Duke U.
Marine Labo.
Beaufort, N. Carolina 28516 919-728-2111

PROJECT/TITLE

Management Practices Affecting Quality and Quantity of Irrigation Return Flow

CITATION

N/A

ABSTRACT/SUMMARY

Field and laboratory research was conducted to determine the effects of irrigation management and fertilizer use upon the quality and quantity of irrigation return flow. The total seasonal discharge of salts from the tile drainage system was directly related to the quantity of water discharged, because the solute concentration of the ground water was essentially constant over time. Under such conditions, reduction of salt content of return flow is accomplished by reduceddrain discharge. Irrigation management for salinity control must be practiced on a major part of a particular hydrologic unit so that benefits are not negated by practices in adjoining areas. Field studies and computer models showed that salts may be stored in the zone above the water table over periods of several years without adversely affecting crop yields on soils with high "buffering" capacity as encourtered in this study. However, over the long term, salt balance must be obtained. Appreciable amounts of nitrate into drainage water at depths of at least 106 cm from the applications of commerical fertilizer and dairy manure to ground surface. Submergence of tile drains in the field reduced nitrate concentrations in the effluent, especially under heavy manure applications. The report was submitted in fulfillment of Grant No. S801040 by Utah State University under the partial sponsorship of the Environmental Protection Agency. Work was completed as of November 30, 1973.

STATUS

Publication Pending #660/2-75-005

INFORMATION/CONTACT

Law, J. P.

B. Industrial

PROJECT/TITLE

Solid Waste Management in the Industrial Chemcial Industry

CITATION

Final report. - Holcombe, J. Kirby; Kalika, Peter W. Research Corp. of New England, Hartford, Conn.

ABSTRACT/SUMMARY

This report presents the results of a national study to evaluate the solid waste management practices of the industrial chemical industry, embodied by standard industrial classification (sic) number 281. Data and information on solid waste management within the industry were obtained through literature review, a questionnaire mailed to a selected group of industrial chemical plants, and field interviews with chemical plant personnel throughout the country. Presented in the report are the following information and data for the industrial chemical industry on a national basis: (1) quantity and quality (character) of solid waste generated; (2) universal parameters affecting solid waste generation; (3) current storage, collection, and disposal practices; (4) annual operating expenses; (5) analysis of the future trends in solid waste management within the industry and factors that might influence them.

STATUS

Publication available from NTIS $6.25/MF $1.45

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Demonstration of Oily Waste Disposal by Soil Cultivation Process

CITATION

N/A

ABSTRACT/SUMMARY

The project consisted of a series of experiments on the treatment of oily sludges (crude tank bottoms, Bunker C, intermediate wax oils) by spreading and cultivation into soil under prevailing climatic conditions. Nine test plots were operated at specific nutrient addition levels. The objectives were to determine; 1) Decomposition rates of various types of oily waste sludges. 2) Effectiveness of adding nutrient supplements. 3) Major microbiological species active in the soil. 4) Cost of the process for the disposal of oily waste. & 5) Depth of oil penetration into the soil. The demonstration phase followed a six-month pilot phase for optimization of waste loading rates and nutrient addition.

STATUS

The project was completed in 1973 after two years of testing. The results were presented at a conference in Atlanta, Ga. by Gordon Reno.
Pub.: Oily Waste Disposal by Soil Cultivation Process-GPO EP1.23/2:R2-72-110 $2.00
NTIS-PB 219059

INFORMATION/CONTACT

B. Baldwin
Shell Oil Company
Deer Park, Texas 77536
(713) 479-2311

PROJECT/TITLE

Phosphoric Acid Recovery System

CITATION

N/A

ABSTRACT/SUMMARY

This project is directed towards recovering acid and regenerating the processing solution of high acid content that is produced in bright aluminum processing. Lancy Laboratories has developed a process aiming for the separation of the acid and the aluminum content of the solution. This process promises an economical recovery of the acid and regeneration of the processing solution. Bright aluminum processing uses a solution of high acid concentration which loses its usefulness as the aluminum concentration increases.

The proposed concept has broad applications for treating waste process solutions used in the metal finishing industry. Successful demonstration of the process may have important environmental impact by significantly reducing chemical consumption and thereby reducing the waste sludges generated as well as the associated large land requirements for disposal.

Presently, 35% of the acid solution is sold to producers of fertilizer. The project is just starting up and is in the testing stage. Some laboratory data is available on request. Maximum recovery to reduce pollution is the primary goal.

STATUS

Project is ongoing. Some publications are available upon request.

INFORMATION/CONTACT

Elbert Fang
EPA
Cleveland Miss.

or

H. A. Lomason
Douglas & Lomason Co.
Detroit, Michigan 48208
(313) 873-2400

PROJECT/TITLE

Recovery of Chromic Acid and Nickel from Plating Waste

CITATION

N/A

ABSTRACT/SUMMARY

This project involves the demonstration of a metal finishing waste abatement system which consists of an integrated nickel and chromium chemical wash treatment, recovery of nickel from the nickel produced in the treatment process, recovery of chromic acid from the rinse and scrubber waters. The system permits the reuse of the bulk of the wastewater and the reduction of sludge.

The state of Michigan has the most stringent pollution codes in the U.S. Since the abatement system has been in progress, the plating effluent has been able to meet the state's water pollution codes. The demonstration system has been in operation for the past 2 years.

The recovery system is a very sophisticated and elaborate system whereby sludge is produced in cake form which is less bulky. The wastewater is precipitated, treated and discharged into the sewer.

STATUS

The demonstration system is an ongoing project.

INFORMATION/CONTACT

C. W. Grose
Michigan Plating & Stamping Co.
740 Ann St., N.W.
Grand Rapids, Michigan 490504
(616) 363-4847

PROJECT/TITLE

Pollution Control in the Commercial Explosives Industry
by J. Patterson, Illinois Institute of Technology Chicago, Il.

CITATION

same as Project/Title

ABSTRACT/SUMMARY

A literature and field study of the commercial explosives industry reveals that on the basis of products manufactured, plant size, and the nature of the wastewater, the industry may be divided into three segments. One, complex facilities, are large plants manufacturing a variety of explosives and intermediate products. The second category is small specialized formulation plants, typically limited to blending explosives fromulations for use in nearby mining activities. The final category is specialty product facilities, devoted to manufacture of select ingredients such as lead ozide and other explosives initiators, blasting caps, electric matches and similar appurtenance items. The explosives industry discharges large volumes of wastewater, typically high in BOD, nitrogen, and solids, frequently at extreme pH, and containing trace to high quanties of dissolved and particulate explosives products. Although pollution abatement technology has not been widely implemented within the explosives industry, there is a potential for significant abatement of pollutant discharge by good housekeeping practice, application of proven treatment technology and under certain conditions total wastewater containment.

STATUS

Publication pending.
#600/2-74-009b

INFORMATION/CONTACT

J. Patterson
Illinois Institute of Technology
Chicago, Il.

PROJECT/TITLE

Effluents of the Inorganic Pesticide Industry
J. Patterson, Institute of Technology Chicago, Ill.

CITATION

same as Project/Title

ABSTRACT/SUMMARY

A literature and field study of the manufacture of inorganic pesticides revealed that many inorganic formulations are still widely used for agricultural purposes. The inorganic pesticide industry is a small but distinct segment of the total agricultural chemical industry. Its manufacturing processes and wastewaters contrast sharply with those associated with organic pesticides. The inorganic pesticide market is dominated by eight products, each of which is discussed in this report with respect to its manufacturing effluent characteristics and applicable pollution control technology. Based upon field studies, it has been demonstrated that five of the eight products can be manufactured without generating any process wastewater. Aqueous effluents from the manufacture of the remaining three inorgainc pesticides appear to be directly controllable by previously demonstrated in-plant control and/or wastewater treatment technologies.

STATUS

Publication pending.

INFORMATION/CONTACT

DesRosiers
P. 202-755-0448

TITLE/PROJECT

Waste Oil Recycling and Disposal

CITATION

N/A

ABSTRACT/SUMMARY

This publication contains information on the generation, collection and disposal of waste oil. It is a technical evaluation of current refining, and other disposal processes and an assessment (environmental) of the gaseous, liquid and solid wastes discharged from such processes. A feasibility test was conducted in a single metropolitan area for a survey designed to obtain information from service stations, waste oil collectors, and industrial users. The project also sought to obtain a national material balance to determine the ultimate fate of used oils.

STATUS

Project completed. Publication: GPO-EP1.23/2:670/2-74-052 $4.00
NTIS PB 234857/AS $6.50

INFORMATION CONTACT

N/A

PROJECT/TITLE

Activated Carbon Treatment of Unbleached Kraft Effluent for Reuse
E. W. Long W. G. Timpe, and R. L. Miller, St. Regis Paper Co., Pensacola, Fl.

CITATION

same as Project/Title

ABSTRACT/SUMMARY

A four-year pilot plant program was carried out to investigate the technical and economic feasibility of treating unbleached kraft pulp and paper mill effluent for reuse. Preliminary laboratory studies and cost estimates indicated that the following treatment sequences should be investigated in the pilot plant.: 1) primary clarification, carbon adsorption; 2) lime treatment, carbon adsorption; 3) primary clarification, bio-oxidation, carbon adsorption. Water of reusable quality can be provided from unbleached kraft effluent by several combinations of treatment utilizing activated carbon. Unbleached pulping effluents typically contain about 1000 color units, 250 mg/l BOD. Reusable water quality as defined in this study is 100 color units and 100 mb/l TOC. The most economical treatment is the microlime-carbon process that utilizes low dosages of lime and clarification followed by carbon adsorption in down-flow granular carbon beds. Capital cost for treatment by this process of 9.6 mgd of unbleached kraft effluent from an 800 ton perday mill was estimated to be approximately $6.7 million. Operating costs, inclusive of capital depreciation, were estimated to be $0.30 per 1000 gal. and $3.58 per pulp-ton, including credit for the reused water. Carbon adsorption in continuous counter-current stirred contractors was found to have promise of lower operating cost and substantially lower capital costs as compared to adsorpiton in fixed beds.

STATUS

Publication pending.
#660/2-75-004

INFORMATION/CONTACT

Ruppersberger, J.

PROJECT/TITLE

Effluents of the Inorganic Gas Industry
J. Patterson, Illinois Institute of Technology, Chicago, Il.

CITATION

same as Project/Title

ABSTRACT/SUMMARY

A literature and field study of the inorganic gas industry revealed that the industry is dominated by 1) air separation plants producing argon, nitrogen and/or oxygen, 2) hydrogen plants and 3) carbon dioxide plants. The major effluent of the industry is cooling water, which may be contaminated with raw product condensates, oil, and grease and water supply and cooling water treatment chemicals. Spent scrubber solutions from product purification may also constitute a significant waste, although newer production technology eliminates this aspect, as well as oil and grease.

STATUS

Publication pending.
600/2-74-009c

INFORMATION/CONTACT

J. Patterson
Illinois Institute of Technology
Chicago, Il.

C. Agricultural Liquid Wastes

PROJECT/TITLE

Automated System for Water Pollution Control from an Animal Production Unit

CITATION

N/A

ABSTRACT/SUMMARY

The specific aims of the project were: 1. To continue to monitor with weekly sampling and laboratory analyses the overall performance characteristics of the plant. 2. To install, test and evaluate the performance of the aerobic digester equipment to be provided by DeLaval Comapny, or if not by them, to purchase and build a surface aerator for installation in the aerobic digester. 3. Surface aerator; submergence and speed variation in rotor; turbidity improvement of the effluent with the use of coagulants; evaluation of chlorine disinfection of the recycled effluent. 4. To automate the disposal of solids onto the nearby farm land with the use of automatically operated irrigation system. 5. To establish some monitoring stations for sampling and analyzing the water from the Loramie Creek that receives the drainage from the research farm of the Botkins Grain and Feed Company. 6. Develop an economic model of the plant to evaluate ways of making the system economically feasible.

STATUS

Completed.

The project was monitored for 3 yrs., and is reputedly the longest study of a project of this type. The report is well documented. The findings were presented in April, 1975 at a conference.

The report has been cleared for publication and is awaiting printing by EPA.

INFORMATION/CONTACT

Dr. EP Taiganides
Agricultural Engineering
614-422-6626
Ohio State University
School of Agriculture

190 N. Oval Dr., 102 Administration Bldg.
Columbus, Ohio 43210

PROJECT/TITLE

Demonstration of Facilities for the Treatment and Ultimate Disposal of Cattle Feedlot Wastes-Ultimate Disposal of Cattle Feedlot Wastes

CITATION

N/A

ABSTRACT/SUMMARY

Objectives of the project are: 1) To determine the effects of feedlot runoff and manure loading rates on the chemical and physical properties of soil, on the quality of runoff from the disposal area and on corn forage yields. 2) To determine the most economical loading of feedlot wastes onto land compatible with pollution control. 3) To determine the concentration of diethylstilbesterol residue in feedlot wastes and its movement through the soil profile beneath the waste disposal area.

STATUS

Project will be continuing for approximatley 6 months. Several publications are available upon request.

INFORMATION CONTACT

H. L. Manges
Kansas State University
School of Engineering/Anderson Hall
Manhattan, Kansas 66502
(913) 532-5580

PROJECT/TITLE

Pollution Control Systems for Beef Cattle and Sheep

CITATION

N/A

ABSTRACT/SUMMARY

The objective of this project is the abatement of pollution through improved systems for controlling beef cattle and sheep waste. Systems for managing wastes from housed and feedlot beef cattle and sheep will be developed and evaluated for economic abatement of air, water and soil pollution. Permanent effluent land irrigation installations will be designed for disposal or utilization runoff from a beef feedlot holding pond to complete a total feedlot runoff control system. Attertion will be given to developing improved handling systems for managing the solid waste. Units will be managed, tested and improved as necessary for system optimization. The components of collection, treatment, transport and disposal will be included in the design systems. Disposal of treated effluent to land will be investigated to develop application rates for optimum crop use.

STATUS

Project is still in progress.

INFORMATION CONTACT

Conray B. Gilbertson
U.S.D.A. Meat Animal Research Center
Clay Center, Nebraska 68933
FTS 402 475-3669
(402) 472-2824

PROJECT/TITLE

Evaluation of Components and Systems for Handling Waste From Housed Swine

CITATION

N/A

ABSTRACT/SUMMARY

The objective of this project is to reduce the pollution potential of housed swine through improved waste systems. Alternative methods of collection, treatment, transport and disposal of waste from housed swine will be developed and evaluated as component parts of a total system for economic reduction of the pollution potential of waste from all phases of swine production. Major components of systems will be evaluated, improved, and combined for development of optimum total systems. Evaluations will be based on labor, initial and operating costs, effects on livestock production, and degree of control over pollution of air, waste and soil.

STATUS

Project is still in progress

INFORMATION/CONTACT

Conray B. Gilbertson
U.S.D.A. Meat Animal Research Center
Clay Center, Nebraska 68933
FTS 402 475-3669
(420) 472 2874

D. Commercial Liquid Waste

PROJECT/TITLE

Shrimp Canning Waste Treatment Study

CITATION

N/A

ABSTRACT/SUMMARY

The objectives of this project are: 1) Characterize physically, chemically and biologically the wastewater from a typical shrimp canning plant. 2) Measure the wastewater flows from a typical shrimp canning plant. 3) Evaluate and recommend changes in canning process operations to reduce wastewater flows. 4) Perform bench scale and pilot scale studies on shrimp canning wastes in order to develop design and operational criteria for selected treatment methods. 5) Determine the economics of various methods of solid waste disposal.

This project represents the initial stage of a continuing project. The next phase will involve the design of a wastewater treatment facility. The designing of the facility is expected to be completed by December, 1976.

STATUS

Preliminary Report

GPO-EP 1.23/2:660/2-74-061 $2.05
NTIS-PB 239 050/AS

INFORMATION/CONTACT

A. J. Szabo
American Shrimp Canners Association
P.O. Box 50774
New Orlean, La. 70150
(318) 234-4566

PROJECT/TITLE

Food Processing Wastes

CITATION

N/A

ABSTRACT/SUMMARY

This project dealt with the wastes generated by Oregon's primary food processing industry, and involved the evaluation of waste occurrence and waste disposal systems currently being used; estimation of the extent and seriousness of present and future problems; establishment of guidelines for the selection of research which could most reasonably help alleviate the critical pollution problems; and implementation of individual research projects involving waste reduction, waste treatment, and by-product development.

The end-of-pipe flows and the discharges from unit operations were monitored for flow, pH, temperature, settleable solids, turbidity, suspended solids, total solids, coliform, total coliform, fecal streptococcus,COD, BOD and chemical concentrations. The results are expressed, where appropriate, as concentrations (e.g., mg U) and in terms of production (e.g., lb/T).

STATUS:

Information and publications may be acquired from the Food Science and Technology Department, Oregon State Univeristy.

Note:

The effluents were tested through spray irrigation methods using "guess amounts" and results of the various concentrations were recorded. Concentration results are listed for each food processing industry.

INFORMATION CONTACT

Mr. Soderquist
Food Science & Technology
Oregon State University
Corvalis, Oregon 97331
(503) 752-1141, 6719

PROJECT/TITLE

Techniques for Disposal of Wastes from Fruit and Vegetable Processing Plants

CITATION

N/A

ABSTRACT/SUMMARY

Objectives: Evaluate methods for disposing or reducing saline wastes from food processing operations. Develop techniques for utilizing or reducing solid and liquid wastes from food processing plants. Determine whether pesticide residues, if present, can be reduced in or removed from food processing wastes.

Approach: The wastes will be subjected to separation, extraction of various components, dehydration or fermentation, submerged combustion, and other chemical treatments, where applicable. The main commodity wastes will include cucumbers, cabbage and tomatoes.

Progress: Progress has been made in water reuse thereby reducing the total volume for disposal. Solid wastes are high in protein and have no antinutritional factors. Cucumbers cured in recycled brine were as good as or slightly better than those cured in fresh brine. Recycled brine was filtered and used for fresh pack pickles.

The final effluent is disposed of in lagoons. Spray irrigation of the effluent on fields is now being tested.

STATUS

The project is just getting started with initial promising results.

INFORMATION CONTACT

J. R. Geisman
Ohio State U. and Ohio Research & Development Center
20001 Fyffe Court
Columbus, Ohio 43210
(614) 422-5169

PROJECT/TITLE

The Better Whey; A Dilemma

CITATION

Proceedings: Second National Symposium on Food Processing Wastes, Sidney Boxer. U.S. Environmental Protection Agency, Wash., D.C. 3/1971. pp. 409-412.

ABSTRACT/SUMMARY

The cheese industry has the problems of waste whey, a heavy pollutant because of its high BOD and yet a food by-product with excellent nutritive value. Dairy Research and Development Corporation suggests the establishment of regional whey recovery plants to treat the whey from surrounding industries since whey recovery is such an expensive process that small dairy processing plants cannot afford to install the equipment. This research and development outfit has built a demonstration plant at Vernon, New York in cooperation with Dairylea of New York. Whole whey for use as a food or food additive is recovered at this facility by spray drying, the most efficient and economical method discovered by previous research. Laval Separator Company has built the equipment for the demonstration plant. One of the major problems encountered in this project was the conversion of cottage cheese whey, which is more acidic than hard-cheese whey and more difficult to process. (D) (G)

This document is retained in the SWIRS library.

STATUS

N/A

INFORMATION CONTACT

N/A

E. Institutional Liquid Wastes

TITLE/PROJECT

Waste Disposal Systems for Cold Regions

CITATION

N/A

ABSTRACT/SUMMARY

The purpose of this project is to develop techniques and criteria for disposal of waste from military facilities, and for predicting, evaluating and controlling the effects of these waste on environmental quality in cold regions.

Major areas of research include treatment of wastewater by application to land as well as management of thermal and solid wastes. Significant aspects of the work with a final report will be issued upon completing of work in each problem area.

STATUS

Continuous project.

INFORMATION CONTACT

Wesley Pietkiewicz
U.S. Army
Cold Regions Research and Engineering Lab.
P.O. Box 282
Hanover , New Hampshire 03755
(603) 643-3200 ext. 243

PROJECT/TITLE

Annotated Bibliography on Hospital Solid Wastes Collection Treatment and Disposal

CITATION

N/A

ABSTRACT/SUMMARY

The project consisted of compiling an annotated bibliography of the available literature on hospital solid waste collection, treatment, and disposal systems. Literature on microbiological or health aspects related to the various systems is included.

STATUS

The project is completed. Publications may be obtained from EPA (Publication EP #00458-02S1)

INFORMATION CONTACT

Oscar Albrecht, Project Officer
Solid and Hazardous Waste Research Laboratory
National Environmental Research Center
Cincinnati, Ohio 45268

F. Mining Liquid Wastes

PROJECT/TITLE

Lake Hope Drainage Demonstration Project

CITATION

N/A

ABSTRACT/SUMMARY

Description: The purpose of the Lake Hope project is to demonstrate the reduction of acid mine drainage pollution by the removal of coal refuse, and the construction of bulkhead seals to flood underground mine workings and thus prevent the formation of acid. The Lake Hope site was chosen for the demonstration project because acidic drainage from abandoned coal mines in the watershed above Lake Hope has severely restricted waste oriented activity in this prime recreational area. A total of 107 mine openings has been noted. The combined acid discharge from these openings is over 700,000 pounds per year. A multiphase mine drainage abatement demonstration program is recommended with major elements including: Removal and/or burial of coal refuse which was scattered throughout the area during active mining operations; sealing of about 50 mine openings.

STATUS

Several standard bulkheads, and one innovative, but not new, bulkhead were used. The dirt was stripped from the hillside at the site of the mine openings. A clay dam was constructed and the stripped dirt was used to re-cover the hillside, thus sealing in the acid mine leakage. It is expected that before the end of 1975, the engineering design phase will be completed. Fifty mines have been cleared of coal refuse and sealed to date.

A feasibility study is pending publication. EPA-R2-73-151 Lake Hope Drainage Demonstration Project.

INFORMATION/CONTACT

WC Roman
Division of Planning
Fountain Sq. 43224
(614) 466-2333

PROJECT/TITLE

West Shade River Abatement Demonstration Project

CITATION

N/A

ABSTRACT/SUMMARY

The concepts of sand abatement, strip-mine reclamation and mine-acid control are the objectives of the project. The demonstration project will seek to show how the use of sludge, fertilizing, liming and other minor techniques will permit the growth and self-regeneration of various grasses, shrubs and trees.

The demonstration project is being conducted in Meigs County, Ohio, which is a part of Appalachia. Severe erosion problems occurring in certain strip-mine areas can be eliminated or controlled utilizing methods and materials which have been researched. Sand erosion from high walls and spoil banks causes considerable property loss due to the deposition of sand over once-tillable soils and the clogging of existing waterways.

One of the problems encountered in this project is the distance from which the sludge had to be transported. The transportation of sludge from the waste treatment facility to the Appalachian hills is expensive.

STATUS

A final report is pending

INFORMATION CONTACT

Appalachian Regional Commission
C. Meir
State Department of Natural Resources
Columbus, Ohio 43212
(614) 466-3066

G. Miscellaneous

PROJECT/TITLE

Application and Procurement of Automatic Wastewater Samplers by R.P. Lauch, Methods Development and Quality Assurance Research Laboratory, EPA Cinn., Ohio.

CITATION

Application and Procurement of Automatic Wastewater Samplers by R.P. Lauch, Methods Development and Quality Assurance Research Laboratory, EPA Cinn., Ohio.

ABSRTACT/SUMMARY

Application and procurement of automatic sampling devices are discussed. Different sampler characteristics including composition proportionality, preservation, lift, and power are described. Manufacturers are listed. Application is discussed with reference to compliance with the National Pollutant Discharge Elimination System permit program, treatment plant control, and other uses. Method of selection and procurement (involving application, familiarization, and purchase) are discussed.

STATUS

Publication Pending. (In House Project)
670/4-75-003

INFORMATION/CONTACT

EPA
R. P. Lauch
(513)684-2935

PROJECT/TITLE

Alternative Systems for Supplying Dissolved Oxygen in Wastewater Treatment by R. Smith and W. F. McMichael, Advanced Waste Treatment Research Laboratory, EPA Cincinnati, Ohio.

CITATION

Alternative Systems for Supplying Dissolved Oxygen in Wastewater Treatment by R. Smith and W. F. McMichael, Advanced Waste Treatment Research Laboratory, EPA Cincinnati, Ohio.

ABSTRACT/SUMMARY

Various alternative systems for supplying oxygen to wastewater treatment processes were studied and evaluated in terms of cost and effectiveness. Systems which deliver atmospheric air to the process such as diffused aeration, mechanical aeration, and turbine aeration are compared to systems which deliver pure oxygen gas. The relationship between oxygen consumption and excess sludge production in the activated sludge process is quantified. Factors such as the diurnal variation in oxygen demand and the oxygen demand as a function of distance along the aerator in the activated sludge process are studied. Finally, the total cost for oxygen supply expressed as cents per pound of oxygen dissolved in the wastewater is estimated as a function of total oxygen consumption expressed as tons of oxygen used per day. The least costly system was found to be mechanical aeration. The pure oxygen system was found to cost roughly the same as a diffused air system with an aeration efficiency of 54%.

STATUS

Publication pending
#670/2-75-001

INFORMATION/CONTACT

EPA
Smith R.
513-684-8352

PROJECT/TITLE

Upgrading Wastewater Stabilization Ponds to Meet New Discharge Standards by E. J. Middlebrooks, D. H. Falkenborg, R. F. Lewis, and D. J. Ehreth, Utah State University Logan, Utah

CITATION

same as PROJECT/TITLE

ABSTRACT/SUMMARY

The question as to whether lagoons, as they now exist, meet the new secondary treatment standards and what methods would work to upgrade lagoon treatment in cases where they presently do not meet the standards is of high priority for many Regional Offices of EPA. The symposium was held for EPA staff and State Officials to review the Office of Research and Development's program for upgrading lagoons. The intermittent sand filter, land application of algae laden effluents and the submerged rock filter offer good potential for cost effective upgrading. The basic biology of the treatment mechanism, disinfection technology, the controlled discharge operation (and results), cost effective analysis, and new fields of research were covered by speakers. Intermittent sand filtration, submerged rock filtration, and land application of sewage effluents are effective alternatives to removing algae from sewage lagoons.

STATUS

Publication Pnding
670/9-75-004

INFORMATION CONTACT

E. J. Middlebrooks
D. H. Falkenborg
Utah State University
Logan, Utah

PROJECT/TITLE

Solid Waste Management Technology Assessment

CITATION

Boothe, W.A.; General Electric Corporate Research and Development,
Schenectady, N. Y.; Dec. 74; 367p

ABSTRACT/SUMMARY

This report contains a thorough analysis of all the methods for processing and disposing of solid waste currently in use or being considered. It includes not only the conventional disposal processes such as land fill, composting, and incineration but also the newer resource recovery technologies such as pyrolysis, material and energy recovery which are now emerging from the laboratory. In addition to analysis of complete processes, discussions on the merits or key pieces of equipment such as shredders, air separators, and conveyors are also included. The analysis includes a description of the technical features of each process and how it works, a review of operating history and experience to date, and estimates of both capital and operating costs as well as scale-up considerations. Numerous tables are provided which allow ready comparison of competing processes in terms of net energy recovered, effluents, weight of materials to be land filled, etc.

STATUS

Publication available. NTIS PB-238 144/0S1

INFORMATION/CONTACT

N/A

PART II - SOLIDS

A. Processed Wastes - Industrial

PROJECT/TITLE

Geochemical Controls on Trace Element Concentrations in Natural Waters of a Proposed Coal Ash Landfill Site

CITATION

N/A

ABSTRACT/SUMMARY

The geochemical controls on various (8) trace elements will be determined for natural waters of a proposed ash storage landfill site accompanying a coal fueled power plant to be built in N. E. Kansas. The study is the first step in evaluating the effect on water quality caused by the large amount of trace elements concentrated in the ash or volatilized during the burning of the coal when the plant is operative.

The present ranges and temporal variation of trace element concentrations will be determined in precipitation, surface, and ground waters in the drainage basins of the proposed landfill site and an adjacent small stream. The chemical constituents and properties of soils and bedrock in the two basins will be made and their controls on the addition, removal, and movement of the elements will be evaluated and compared.

STATUS

The study has been in progress for 2 yrs. during which time the natural waters have been monitored. The proposed plant is not under construction. The data that has been collected to date gives a systematic approach to the monitoring of water. The preliminary report contains data on monthly samples of water and data on 10-12 elements.

INFORMATION CONTACT

D. O. Dittemore
Kansas State Univ.
School of Arts/Dickens Hall
Manhattan, Kansas 66502
(913) 532 6724

RESIDUAL WASTE RECLAMATION

Section II

Part I Sludge Disposal

Part II Solid Disposal

Part III Liquid Disposal

PROJECT/TITLE

Sludge Disposal from Sulfur Dioxide and Particulate Removal Processes

CITATION

N/A

ABSTRACT/SUMMARY

Description: A study to summarize and evaluate existing data pertaining to sludge disposal. Investigate the potential methods for improving the characteristics of sludge, and recommend future testing required. The objective of the program is to evaluate the data which is available on sludge disposal and its properties so that a logical test program can be established. The scope of the program is to summarize and evaluate the available data to determine the problem areas, to summarize and evaluate the methods for improving the characteristics of sludge, and to develop a test program for improving the characteristics of sludge. Existing data pertaining to sludge disposal is summarized.

STATUS

The paper study has been completed. A small pilot plant (1,000 lbs per hr) has been built, and produces a leachate from sludge which is being tested on a small scale vegetable farm. Good results have been attained, and trace elements and toxicity studies will be performed. The leachate is being used by fertilizer producers, also. Plant production will be increased to produce 3,000 lbs of fetilizer.

INFORMATION CONTACT

B. McKinney or James Crow
U.S. Tennessee Valley Authority
Chattanooga, Tenn. 37402
(615) 755-3011

Pages 112, 113 and 114 are blank.

PROJECT/TITLE

Techniques for Disposal of Wastes from Fruit and Vegetable Processing Plants

CITATION

N/A

ABSTRACT/SUMMARY

Objectives: Evaluate methods for disposing or reducing saline wastes from food processing operations. Develop techniques for utilizing or reducing solid and liquid wastes from food processing plants. Determine whether pesticide residues, if present, can be reduced in or removed from food processing wastes.

Approach: The wastes will be subjected to separation, extraction of various components, dehydration or fermentation, submerged combustion, and other chemical treatments, where applicable. The main commodity wastes will include cucumbers, cabbage and tomatoes.

Progress: Progress has been made in water reuse thereby reducing the total volume for disposal. Solid wastes are high in protein and have no antinutritional factors. Cucumbers cured in recycled brine were as good as or slightly better than those cured in fresh brine. Recycled brine was filtered and used for fresh pack pickles.

The final effluent is disposed of in lagoons. Spray irrigation of the effluent on fields is now being tested.

STATUS

The project is just getting started with initial promising results.

INFORMATION CONTACT

J. R. Geisman
Ohio State U. and Ohio Research & Development Center
20001 Fyffe Court
Columbus, Ohio 43210
(614) 422-5169

PROJECT/TITLE

Reuse of Solid Waste From Water-Softening Processes

CITATION

Nelson, Raynor D.; Vey, Eben IIT Research Institute, Chicago, Ill.
Final Report

ABSTRACT/SUMMARY

The report summarizes a study of several methods for dewatering a water-softening sludge. Beneficial uses of the dewatered sludge are evaluated. Vacuum filtration after gravity thickening was found to be more economical for the area studied, the Village of Park Forest, Illinois, than centrifuging, lagooning or sand bed drying. The study found that in a dry powder or almost dry condition, the sludge has a potential use as a mineral filler in paints, floor coverings, caulking, and bituminous products, and as a soil admixture and/or soil conditioner.

STATUS

Publication is available from NTIS PB- 224820
$4.25/MF $1.45

Information Contact

N/A

PROJECT/TITLE

Activated Carbon Treatment of Unbleached Kraft Effluent for Reuse
E. W. Long W. G. Timpe, and R. L. Miller, St. Regis Paper Co., Pensacola, Fl.

CITATION

same as Project/Title

ABSTRACT/SUMMARY

A four-year pilot plant program was carried out to investigate the technical and economic feasibility of treating unbleached kraft pulp and paper mill effluent for reuse. Preliminary laboratory studies and cost estimates indicated that the following treatment sequences should be investigated in the pilot plant.: 1) primary clarification, carbon adsorption; 2) lime treatment, carbon adsorption; 3) primary clarification, bio-oxidation, carbon adsorption. Water of reusable quality can be provided from unbleached kraft effluent by several combinations of treatment utilizing activated carbon. Unbleached pulping effluents typically contain about 1000 color units, 250 mg/1 BOD. Reusable water quality as defined in this study is 100 color units and 100 mb/1 TOC. The most economical treatment is the microlime-carbon process that utilizes low dosages of lime and clarification followed by carbon adsorption in down-flow granular carbon beds. Capital cost for treatment by this process of 9.6 mgd of unbleached kraft effluent from an 800 ton perday mill was estimated to be approximately $6.7 million. Operating costs, inclusive of capital depreciation, were estimated to be $0.30 per 1000 gal. and $3.58 per pulp-ton, including credit for the reused water. Carbon adsorption in continuous counter-current stirred contractors was found to have promise of lower operating cost and substantially lower capital costs as compared to adsorpiton in fixed beds.

STATUS

Publication pending.
#660/2-75-004

INFORMATION/CONTACT

Ruppersberger, J.

PROJECT/TITLE

A Color Removal and Fibrous Sludge Disposal Process for the Kraft Paper Industry

CITATION

N/A

ABSTRACT/SUMMARY

This publication discusses the development of an economical design and operational data applicable to the Kraft pulp and paper industry in removal of color in mill effluents and in disposal of fibrous sludges. Color removal was accomplished by lime precipitation of the color bodies and fibers with subsequent regeneration of the lime by sludge combustion in a kiln.

STATUS

Project completed. Publication: GPO-#P1.23.2:660/2-74-008 $1.65
NTIS-PB 235573/AS

INFORMATION CONTACT

N/A

PROJECT/TITLE

Waste Citrus Activated Sludge As a Poultry Feed Ingredient

CITATION

R. H. Jones, J. T. White, and B. L. Damron Winter Garden Citrus Products Corporative Winter Garden, Fl.

ABSTRACT/SUMMARY

The report presents an evaluation of the potential of utilizing waste activated sludge as a poultry feed supplement. The sludge used in this study was obtainted from an activated sludge process treating concentrated citrus waste containing no sanitary wastewater. The sludge was thickened, dewatered and dried using full scale and pilot-scale equipment. The dried sludge was then analyzed for protein, fiber, amino acids, nutrients and moisture. Poultry feeds containing varying concentration of sludge were prepared. Two experiments with boiler chicks, each of three weeks duration, one 8- week broiler study, and six-month laying hen study were conducted to determine the effect of the inclusion of sludge in poultry diets on performance. It is shown in this report that the inclusion of sludge in property formulate diets up to 7.5 percent did not significantly affect poultry performance or meat or egg quality. The value of the sludge was calculated based on the reduction in feed ingredients resulting from the inclusion of sludge. It was found that the value of the recovered sludge significantly reduced the total cost of sludge handling.

STATUS

Publication Pending. EPA #660/2-75-001

INFROMATION CONTACT

EPA
Thompson, H.

PROJECT/TITLE

Reclamation of Metal Values from Metal Finishing Waste Treatment Sludges

CITATION

N/A

ABSTRACT/SUMMARY

The objective of this project was to develop information on sludge volumes and characteristics produced in metal finishing plants, determine the effects of weathering on sludges in current disposal practice, and carry out bench scale investigations on potentially attractive techniques for recovering metals from these sludges. On the basis of the investigation, the process design and economics will be determined for selected metal recovery systems.

STATUS

Publication pending. Report #670/2-75-018

INFORMATION CONTACT

Ray Smithson
Battelle Memorial Institute
Columbus, Ohio
(614) 299-3151 ext. 2342

PROJECT/TITLE

West Shade River Abatement Demonstration Project

CITATION

N/A

ABSTRACT/SUMMARY

The concepts of sand abatement, strip-mine reclamation and mine-acid control are the objectives of the project. The demonstration project will seek to how the use of sludge, fertilizing, liming and other minor techniques will permit the growth and self-regeneration of various grasses, shrubs and trees.

The demonstration project is being conducted in Meigs County, Ohio, which is a part of Appalachia. Severe erosion problems occurring in certain strip-mine areas can be eliminated or controlled utilizing methods and materials which have been researched. Sand erosion from high walls and spoil banks causes considerable property loss due to the deposition of sand over once-tillable soils and the clogging of existing waterways.

One of the problems encountered in this project is the distance from which the sludge had to be transported. The transportation of sludge from the waste treatment facility to the Appalachian hills is expensive.

STATUS

A final report is pending.

INFORMATION/CONTACT

Appalachian Regional Commission or

C. Meir
State Department of Natural Resources
Columbus, Ohio 43212
(614) 466-30[illegible]6

PROJECT/TITLE

Combined Sludge Processing Project

CITATION

N/A

ABSTRACT/SUMMARY

CCCSD has built an Advanced Treatment Test Facility (TTF) to treat raw sewage with lime followed by biological nitrification and denitrification at up to 2.5 MGD. The excess lime sludge is dewatered in a pair of centrifuges operated in series to separate calcium carbonate from calcium phosphate organic matter and inerts. Calcium carbonate is to be converted to recovered lime in one set of multiple heart furnaces and the residual sludge will be incinerated in another set of furnaces. This proposal documents the studies already carried out leading to the above conclusions and fills in engineering and analytical data necessary to make a complete report.

STATUS

Publication: Sludge Processing For Combined Physical-Chemical-Biological Sludges
GPO-EP 1.23/2:R2-73-250 $2.10
NTIS/PB 223 341

INFORMATION CONTACT

P. H. Caldwell
Central Contra Costa Sanitation District
Walnut Creek, California

PROJECT/TITLE

Effective Utilization of Municipal and Utility Sludges and Ashes

CITATION

N/A

ABSTRACT/SUMMARY

The object of the project was to: 1) Perform a comprehensive literature review and survey of the present municipal and utility sludge and ash production, disposal methods and utilization methods. 2) Determine technical feasibility and economic practicality of more widespread application of present utilization methods. 3) Suggest new utilization methods with consideration of technical feasibility and economic practicality. A search of the literature and contact with a variety of governmental and trade organizations who are producers and/or present or potential users of sludges and ashes were conducted.

STATUS

Completed Publication is pending.
Characterization and Utilization of Municipal and Utility Sludges and Ashes.
Vol. 1
EPA # 670/2-75-033 a, b, c, & d

INFORMATION CONTACT

N/A

PROJECT/TITLE

Sewage Disposal On Forest and Associated Lands

CITATION

ABSTRACT/SUMMARY

The objective of this project is to determine methods for disposal and utilization of sewage effluent and sludge on forest lands without pollution of ground and surface waters, determine the soil physical and chemical characteristics necessary for proper sewage effluent and sludge disposal and renovation on forest lands, and determine the effects of sewage effluent and sludge applications on native and exotic forest vegetation.

Municipal and industrial sewage effluents were applied to a comprehensive range of solids and forest vegetation at field locations in conjunction with municipal land disposal projects. Soil and ground water samples were analyzed for nutrient elements and for potentially toxic materials. Changes in composition in native plant communities and the growth of native and exotic plants were studied following application of chlorinated secondary sewage effluent, wastewater from sewage lagoons, and stabilized sewage sludge to forest lands.

STATUS

The project is a continuing one. Considerable data has been collected that shows that nitrogen is the major pollutant. Reports may be obtained upon request.

INFORMATION CONTACT

After 9/1/75

Stephen Nesbitt
North Central Forest Extension Service
Harrison Road
East Lansing Michigan
(616) 775-7776

PROJECT/TITLE

Using Cropland For Sewage Wastewater And Sludge Disposal W. E. Sopper

CITATION

N/A

ABSTRACT/SUMMARY

The objective was to determine the interaction of soils and plants with sewage wastewater and sludge disposed on cropland and forestland, with emphasis on P, boron, and N reactions in the soil and with the biosphere and on the soil's potential for removing N from wastes by denitrification; develop systems for land disposal of wastewater and sludge.

Hydrologic effects such as perched water tables, interflow and runoff were measured.

STATUS

Completed Publication: Conference on Recycling Treated Wastewater
Through Forest and Cropland
GPO-EPI.23/2:660/2-74-003 $1.20
NTIS-PB 236313/AS

INFORMATION CONTACT

N/A

PROJECT/TITLE

Review of Experience With Landspreading Liquid Sewage Sludge - A Bibliography

CITATION

N/A

ABSTRACT/SUMMARY

The objective of this program was to provide a critical review of existing information and operational experiences in landspreading of liquid sewage sludge. Major emphasis was given to obtaining information concerning unreported landspreading operations currently employed in this country through a telephone survey and visits to representative treatment plants and associated landspreading operations. This information was evaluated with respect to present technology, and environmental impacts from landspreading including evaluation of landspreading subsystems relating to sludge handling and conditioning modes of transport, spreading techniques, and soil and/or crop responses. Further this program also provided a summarization and an updating of sewage sludge landspreading practices found in the literature. An evaluation of the data obtained will identify deficiencies where additional studies are needed and aid in the development of proper design criteria for landspreading systems.

The investigator found that only 3 or 4 sewage treatment plants had a water quality program. There is a lack of intensive monitoring of waste programs, though there is an abundance of field work being done.

Research revealed that approximately 400 plants in the five most populous regions in the U.S. have been landspreading sewage sludge without monitoring for over 50 years.

The completed bibliography contains short histories with annotated bibliographies of 25 treatment plants visited by the researchers.

STATUS

Project is completed and publication is expected in August, 1975

INFORMATION CONTACT:

Office of Research Monitoring
G. K. Dotson
NERC - Cinn., Ohio

TITLE/PROJECT

Fly Ash Filter Aid for Sewage Solids Dewatering and Disposal

CITATION

N/A

ABSTRACT/SUMMARY

The project demonstrated the use of fly ash from a nearby power plant and sludge incinerator ash as filter aids in the pressure filtration of sludges. Pilot plant tests indicated that due to the nature of the sludge from the trickling filter plant other alternate methods of pretreatment would incur severe economic penalties. On the other hand the chemical ingredients in the fly ash and sludge incinerator ash, which are obtained at no cost, permitted adequate dewatering at minimum cost. In addition, the trace minerals in the ashes and the plant food value from the sludge constituted a useable soil conditioner. The City of Cedar Rapids plans to utilize some of this sludge as a soil conditioner and fertilizer in their parks.

STATUS

Project Completed Publication
GPO-EP1.23/2:R 2-73-231 $2.10
NTIS-PB 223-535

INFORMATION CONTACT

N/A

PROJECT/TITLE

Lime Stablized Sludge: Its Stability and Effect on Agricultural Land

CITATION

N/A

ABSTRACT/SUMMARY

An optimum system for the lime stabilization of municipal sewage sludge was first developed and evaluated. The primary objectives of this work were (1) to determine the degree of stability induced in a sludge by lime addition and (2) to determine the effects of spreading lime-stabilized sludge on agricultural land. Lime doses and contact times required to eliminate the pathogenic bacteria and odors from raw sludge were determined by laboratory studies, and the information obtained was translated into design and operational parameters for a pilot scale, continuous flow process. Physical, chemcial and biological characteristics of both the raw and stabilized sludge, were measured. Soil and crop studies, both in a greenhouse and on controlled outdoor plots, were performed to determine the effects of spreading lime-stabilized sludge. Effective lime stabilization of sludge was accomplished by elevating the pH to 12.0 with lime addition and maintaining the pH level for at least 30 minutes.

STATUS

Publication Pending 1975
#670/2-75-012

INFORMATION CONTACT

EPA
J.E. Smith, Jr.
(513) 684-8267

PROJECT/TITLE

Demonstration of Oily Waste Disposal by Soil Cultivation Process

CITATION

N/A

ABSTRACT/SUMMARY

The project consisted of a series of experiments on the treatment of oily sludges (crude tank bottoms, Bunker C, intermediate wax oils) by spreading and cultivation into soil under prevailing climatic conditions. Nine test plots were operated at specific nutrient addition levels. The objectives were to determine; 1) Decomposition rates of various types of oily waste sludges. 2) Effectiveness of adding nutrient supplements. 3) Major microbiological species active in the soil. 4) Cost of the process for the disposal of oily waste. & 5) Depth of oil penetration into the soil. The demonstration phase followed a six-month pilot phase for optimization of waste loading rates and nutrient addition.

STATUS

The project was completed in 1973 after two years of testing. The results were presented at a conference in Atlanta, Ga. by Gordon Reno.
Pub.: Oily Waste Disposal by Soil Cultivation Process-GPO EP1.23/2:R2-72-110 $2.00
NTIS-PB 219059

INFORMATION/CONTACT

B. Baldwin
Shell Oil Company
Deer Park, Texas 77536
(713) 479-2311

PROJECT/TITLE

Cost-Effectiveness Study for Handling and Disposal of Organic Sludges

CITATION

N/A

ABSTRACT/SUMMARY

The goal of this project is to develop mathematical model for all commonly used processes for sludge handling and disposal and to use these models in an Executive program which will size all processes and estimate the cost of the complete treatment train. Processes being considered are gravity thickening, air flotation thickening, centrifugation, anaerobic digestion, elutriation, aerobic digestion, vacuum filters, sand drying beds, multiple hearth incineration, and transport and disposal to land. A total of 181 ways have been identified to handle and dispose of both primary and waste activated sludge. Computation of the cost of these alternative processes will begin when models for aerobic digestion and land disposal have been completed.

STATUS

Final stage of Preparation for Publication

INFORMATION CONTACT

Richard Eilers or Robert Smith
NERC
5555 Ridge Ave.
Cinn., Ohio 45213
684-2200, 8352

PROJECT/TITLE

Sludge Processing, Transportation, and Disposal/Resource Recovery; Planning Perspective

CITATION

N/A

ABSTRACT/SUMMARY

A methodology was developed in this report for use in the 208 planning process for the evaluation of alternatives for the ultimate disposal of residual wastes generated in municipal wastewater treatment plants. This methodology considered technical, economic, social, and institutional factors pertinent to a thorough review of alternatives.

Residual wastes generated in municipal wastewater treatment plants were characterized. Handling and treatment processes for the residual wastes were discussed and evaluated in light of qualitative and quantitative changes to the residual wastes. Liquid, gaseous, and solid sidestreams produced in residual waste treatment were evaluated and rail, pipeline, barge, and truck transport of residual wastes were analyzed.

Environmental, operational, and institutional constraints to the use of ocean disposal, lagoons, sanitary landfills, sludge recycling, and land reclamation were presented.

STATUS

Completed in Feb. 1975 - EPA Publication - Contract # 68-01-3104
Publication Pending

INFORMATION CONTACT

Dr. Dean Neptune
Water Planning Division/Planning Assistance
401 M St. S.W.
Wash. D.C. 20460
(202) 426-2474

PROJECT/TITLE

Techniques for Disposal of Wastes from Fruit and Vegetable Processing Plants

CITATION

N/A

ABSTRACT/SUMMARY

Objectives: Evaluate methods for disposing or reducing saline wastes from food processing operations. Develop techniques for utilizing or reducing solid and liquid wastes from food processing plants. Determine whether pesticide residues, if present, can be reduced in or removed from food processing wastes.

Approach: The wastes will be subjected to separation, extraction of various components, dehydration or fermentation, submerged combustion, and other chemical treatments, where applicable. The main commodity wastes will include cucumbers, cabbage and tomatoes.

Progress: Progress has been made in water reuse thereby reducing the total volume for disposal. Solid wastes are high in protein and have no antinutritional factors. Cucumbers cured in recycled brine were as good as or slightly better than those cured in fresh brine. Recycled brine was filtered and used for fresh pack pickles.

The final effluent is disposed of in lagoons. Spray irrigation of the effluent on fields is now being tested.

STATUS

The project is just getting started with initial promising results.

INFORMATION CONTACT

J. R. Geisman
Ohio State U. and Ohio Research & Development Center
20001 Fyffe Court
Columbus, Ohio 43210
(614) 422-5169

Pages 133 and 134 are blank.

PROJECT/TITLE

The Better Whey; A Dilemma

CITATION

Proceedings: Second National Symposium on Food Processing Wastes, Sidney Boxer. U.S. Environmental Protection Agency, Wash., D.C. 3/1971. pp. 409-412.

ABSTRACT/SUMMARY

The cheese industry has the problems of waste whey, a heavy pollutant because of its high BOD and yet a food by-product with excellent nutritive value. Dairy Research and Development Corporation suggests the establishment of regional whey recovery plants to treat the whey from surrounding industries since whey recovery is such an expensive process that small dairy processing plants cannot afford to install the equipment. This research and development outfit has built a demonstration plant at Vernon, New York in cooperation with Dairylea of New York. Whole whey for use as a food or food additive is recovered at this facility by spray drying, the most efficient and economical method discovered by previous research. Laval Separator Company has built the equipment for the demonstration plant. One of the major problems encountered in this project was the conversion of cottage cheese whey, which is more acidic than hard-cheese whey and more difficult to process. (D) (G)

This document is retained in the SWIRS library.

STATUS

N/A

INFORMATION CONTACT

N/A

PROJECT/TITLE

Seafood Solid Waste in Oregon: Disposal or Recovery

CITATION

Special rept: Kreag, Rebecca; Smith, Frederick J.

ABSTRACT/SUMMARY

The quantity and nature of seafood waste from processing operations are described. Ten alternatives to discharge directly into estuaries are presented. Three methods of disposal were studied for these wastes: incineration, barging off shore and landfill. Landfill appears to be the least costly and the most promising disposal alternative because of the limited quantity of wastes involved. Seven alternatives were considered for recovery of wastes for a marketable product: flesh for human consumption; fish protein concentrate; fishmeal; mink feed; fish food; fertilizer; and chitin for new special products.

STATUS

NTIS $3.00/MF $1.45 COM-74-11245/9

INFORMATION CONTACT

N/A

PROJECT/TITLE

Copper Recovery from Brass Mill Discharge by Cementation with Scrap Iron
By P. O. Case, Anaconda Company Waterbury, Ct.

CITATION

same as Project/Title

ABSTRACT/SUMMARY

This report presents the results of studies of copper recovery (and incidental reduction of hexavalent chromium) in brass mill discharge by passage of the discharge over scrap iron in a rotating drum. The drum feed consisted of normal production discharge of combined pickle rinse water and spent sulfuric acid and sulfuric acid-bichromate pickle. About half of the total mill waste discharge over a period of 16 weeks was processed. Four modes of drum operation were studied: (1) continuous rotation, (2) no rotation, (3) intermittent rotation (1 hr off - 5 min on), and (4) intermittent rotation (2-1/2 hr off - 10 min on). Each mode was studied at two flow levels and two scrap iron surface area levels. Data were evaluated in terms of percent cementation of available copper, excess iron consumption over theoretical, and completeness of chromium reduction. Results indicate that the over-riding factor in the efficiency of copper cementation is the level of copper in the feed solution. Hexavalent chromium is effectively reduced providing the pH is below 2.5

STATUS

Publication Pending #670/2-75-029

INFORMATION/CONTACT

EPA
R. Tabakin
201-548-3414

PROJECT/TITLE

Recovery of Chromic Acid and Nickel from Plating Waste

CITATION

N/A

ABSTRACT/SUMMARY

This project involves the demonstration of a metal finishing waste abatement system which consists of an integrated nickel and chromium chemical wash treatment, recovery of nickel from the nickel produced in the treatment process, recovery of chromic acid from the rinse and scrubber waters. The system permits the reuse of the bulk of the wastewater and the reduction of sludge.

The state of Michigan has the most stringent pollution codes in the U.S. Since the abatement system has been in progress, the plating effluent has been able to meet the state's water pollution codes. The demonstration system has been in operation for the past 2 years.

The recovery system is a very sophisticated and elaborate system whereby sludge is produced in cake form which is less bulky. The wastewater is precipitated, treated and discharged into the sewer.

STATUS

The demonstration system is an ongoing project.

INFORMATION/CONTACT

C. W. Grose
Michigan Plating & Stamping Co.
740 Ann St., N.W.
Grand Rapids, Michigan 490504
(616) 363-4847

TITLE/PROJECT

Fly Ash Filter Aid for Sewage Solids Dewatering and Disposal

CITATION

N/A

ABSTRACT/SUMMARY

The project demonstrated the use of fly ash from a nearby power plant and sludge incinerator ash as filter aids in the pressure filtration of sludges. Pilot plant tests indicated that due to the nature of the sludge from the trickling filter plant other alternate methods of pretreatment would incur severe economic penalties. On the other hand the chemical ingredients in the fly ash and sludge incinerator ash, which are obtained at no cost,permitted adequate dewatering at minimum cost. In addition, the trace minerals in [illegible] ashes and the plant food value from the sludge constituted a [illegible] soil conditioner. The City of Cedar Rapids plans to utilize some [illegible] sludge as a soil conditioner and fertilizer in their parks.

STATUS

Project Completed Publication
GPO-EP1.23/2:R 2-7[illegible] $2.10
NTIS-PB 223-535

INFORMATION CON[illegible]

N/A

PROJECT/TITLE

Solid Waste Management Technology Assessment

CITATION

Boothe, W.A.; General Electric Corporate Research and Development, Schenectady, N. Y.; Dec. 74; 367p

ABSTRACT/SUMMARY

This report contains a thorough analysis of all the methods for processing and disposing of solid waste currently in use or being considered. It includes not only the conventional disposal processes such as land fill, composting, and incineration but also the newer resource recovery technologies such as pyrolysis, material and energy recovery which are now emerging from the laboratory. In addition to analysis of complete processes, discussions on the merits or key pieces of equipment such as shredders, air separators, and conveyors are also included. The analysis includes a description of the technical features of each process and how it works, a review of operating history and experience to date, and estimates of both capital and operating costs as well as scale-up considerations. Numerous tables are provided which allow ready comparison of competing processes in terms of net energy recovered, effluents, weight of materials to be land filled, etc.

STATUS

Publication available. NTIS PB-238 144/OS1

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Elimination of Water Pollution by Recycling Cement Plantdusts

CITATION

N/A

ABSTRACT/SUMMARY

Objectives overall - Elimination of problems associated with disposal of kiln dust from cement plants. Specifically by: 1) Formation of clinker with concomitant violatilization of alkalies. 2) Leaching of water-soluble alkalies and return of leachate to system. 3) Other uses of dust, fertilizer, soil stabilizer, or agricultural limestone. 4) Use of dust as admixture to modify cement or cement products. Present approach - Heat treatment of clay or shale fraction to remove alkalies from a portion of raw feed and/or to remove alkalie from total dust. Fluid bed furnace to remove alkalies at low temperature by control of the furnace atmosphere presently underway.

STATUS

The project is in the final writing stage. It was deemed somewhat successful by the investigators. Water soluble alkalies in cement dust were removed by flame-spraying.

Other phases of the project will continue until maximum results are gained. The project will be funded by private industry upon the exhaustion of governmental funds.

INFORMATION CONTACT

Dr. Miller
Protalnd Cement Association
5420 Old Orchard Rd.,
Skokie, Ill. 60076
(312) 966-6200

PROJECT/TITLE

Reclamation and recycling - An Economic Overview

CITATION

Schilling, Spencer, A., Richard J. Bengston, and John W. Lindholm, Jr.

ABSTRACT/SUMMARY

It is sometimes assumed that the same technology that has created the wealth of products that we now throw away can create the means of reclaiming the valuable components in the wastes. Technology is needed, of course, but along with it must come new organizational structures the will encourage regional and State planning and operation of solid waste operations. One of the reasons that recycling is now so uneconomical is that depletion allowances and discriminatory freight rates encourage exploitation of virgin resources rather than reuse of secondary materials. Of the 360 million tons of wastes per year generated by residential, commercial, institutional, and manufacturing establishments, about one third is recycled. Most of this reuse is in the production process itself, such as the return to the pulping process of paper broke. The real waste of resources occurs once the materials find their way into the heterogeneous waste collected by the municipal collection vehicle. Systems for reclaiming this waste exist; the reasons why recycling does not take place are not so much techological as they are economic and sociopolitical. The main economic difficulty is the lack of demand for recycled goods. Often the mills to make paper and steel are not close to urban centers, where the waste are, but close to coal or pulpwood supplies. Legal obstacles stand in the way of reclamation of junk cars; title procedures are long and involved and delay the return of the automobile to the production stream. A great deal of economic dislocation might result from recycling efforts; unemployment in primary resources industries is an example of one potential problem. (D) (G)

STATUS

Retained in SWIRS Library

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Contingency Planning for Resource Recovery

CITATION

N/A

ABSTRACT/SUMMARY

A resource recovery plant has been designed by the National Center for Resource Recovery, and is presently under construction in New Orleans, La. The plant will be operated by a private firm.

The plant is scheduled to open on May 1, 1976 with a 650 ton per day material recovery system that utilizes shredding, classifying and extraction of aluminum, glass, iron, steel, and non-ferrous metals (excluding aluminum) and paper. The residuals, which will be mostly organic, will be landfilled.

The waste system is so designed as to have no adverse environmental impact upon ground or surface water. Water sampling is being done around the site to establish hydrogeological data, and sampling will continue during the course of operation.

The plant is being built on city-owned land. The cost of the plant, with the exception of the recovery system, is borne by the private firm. The resource recovery system is financed by the National Center for Resource Recovery, a non-profit research organization.

The plant will process one-half of the city's waste initially. Two incinerators will be de-commissioned upon completion of the plant.

Some of the profit gained from the sale of recovered materials will be shared by the city of New Orleans.

STATUS

N/A

INFORMATION/CONTACT

J. F. Bernheisel
National Center for Resource Recovery
1211 Connecticut Ave., N.W.
Washington, D.C. 20036 (202) 223-6154

PROJECT/TITLE

Food Processing Wastes

CITATION

N/A

ABSTRACT/SUMMARY

This project dealt with the wastes generated by Oregon's primary food processing industry, and involved the evaluation of waste occurrence and waste disposal systems currently being used; estimation of the extent and seriousness of present and future problems; establishment of guidelines for the selection of research which could most reasonably help alleviate the critical pollution problems; and implementation of individual research projects involving waste reduction, waste treatment, and by-product development.

The end-of-pipe flows and the discharges from unit operations were monitored for flow, pH, temperature, settleable solids, turbidity, suspended solids, total solids, coliform, total coliform, fecal streptococcus,COD, BOD and chemical concentrations. The results are expressed, where appropriate, as concentrations (e.g., mg U) and in terms of production (e.g., lb/T).

STATUS:

Information and publications may be acquired from the Food Science and Technology Department, Oregon State Univeristy.

Note:

The effluents were tested through spray irrigation methods using "guess amounts", and results of the various concentrations were recorded. Concentration results are listed for each food processing industry.

INFORMATION CONTACT

Mr. Soderquist
Food Science & Technology
Oregon State University
Corvalis, Oregon 97331
(503) 752-1141, 6719

PROJECT/TITLE

Annotated Bibliography on Hospital Solid Wastes Collection Treatment and Disposal

CITATION

N/A

ABSTRACT/SUMMARY

The project consisted of compiling an annotated bibliography of the available literature on hospital solid waste collection, treatment, and disposal systems. Literature on microbiological or health aspects related to the various systems is included.

STATUS

The project is completed. Publications may be obtained from EPA (Publication EP #00458-02S1)

INFORMATION CONTACT

Oscar Albrecht, Project Officer
Solid and Hazardous Waste Research Laboratory
National Environmental Research Center
Cincinnati, Ohio 45268

PROJECT/TITLE

Flyash Disposal

CITATION

N/A

ABSTRACT/SUMMARY

This project involved the disposal of flyash as a slurry in a worked out mine. The resultant mixture of slurry water and mine water were chemically treated before discharge to a stream. This project has been in existence for the past five years and is scheduled to continue for another 5 years.

The dissolved salts in the discharge has dropped from 3000 PPI to 2000 PPI to date. Research is continuing to reduce the salt content to 1500 PPI or lower. The state of Penn. treats the discharge as a process rather than a mine effluent. The present PPI would be allowable if the discharge was treated as mine drainage. However, the mechanism is working well, and research will continue.

STATUS

Ongoing Project. Information will be sent upon request.

INFORMATION CONTACT

Mr. Robert O'Hare
Mr. Nelson Tonet
Duquesne Light Company
435 6th Avenue
Pittsburgh, Pa. 15219

PROJECT/TITLE

Fuel Gas Production from Solid Waste

CITATION

NSF Contract C-827 (covering the period: June 28, 1973 to December 31, 1974) Initiated June 28, 1973. Dynatech Report #1258. Prepared by R.G. Kispert, S.E. Sadek, L.C. Anderson, and D.L. Wise.

ABSTRACT/SUMMARY

The primary objective of this program is the development of a process for the economic production of pipeline quality fuel gas from the large organic fraction of municipal solid waste. As part of a continuing effort to find techniques for supplementing the natural gas resources in the United States, Consolidated Natural Gas Service Company, Inc., initiated at Dynatech R/D Company about four years ago, extensive laboratory experiments on the anaerobic digestion of solid waste. As a result of these experiments, the feasibility of this gas production process has been demonstrated. The process has national applicability. Preliminary cost estimates based on a computer model developed at Dynatech for Consolidated indicated that large plants in metropolitan areas will produce fuel gas at an acceptable cost.

The program, funded by NSF/RANN, initially called for engineering analysis and computer optimization of the process on a production scale, followed by initiation of pilot plant work. Contract amendment No.1, April 9, 1974, changed the project objectives to delete the design, procurement, and assembly of a pilot plant. Under this redirection the economic model of the process is to be confirmed and applied to analysis and review of the projected performance of a full scale plant for the manufacture of fuel gas from solid waste. An added objective is the evaluation and specification of a proof-of-concept pilot plant.

STATUS

N/A Final Report - NSF/RANN/SE/C-827/PR/74/5

INFORMATION/CONTACT

Dynatech R/D Company
99 Erie Street
Cambridge, Massachusetts 02139

PROJECT/TITLE

Techniques for Disposal of Wastes from Fruit and Vegetable Processing Plants

CITATION

N/A

ABSTRACT/SUMMARY

Objectives: Evaluate methods for disposing or reducing saline wastes from food processing operations. Develop techniques for utilizing or reducing solid and liquid wastes from food processing plants. Determine whether pesticide residues, if present, can be reduced in or removed from food processing wastes.

Approach: The wastes will be subjected to separation, extraction of various components, dehydration or fermentation, submerged combustion, and other chemical treatments, where applicable. The main commodity wastes will include cucumbers, cabbage and tomatoes.

Progress: Progress has been made in water reuse thereby reducing the total volume for disposal. Solid wastes are high in protein and have no antinutritional factors. Cucumbers cured in recycled brine were as good as or slightly better than those cured in fresh brine. Recycled brine was filtered and used for fresh pack pickles.

The final effluent is disposed of in lagoons. Spray irrigation of the effluent on fields is now being tested.

STATUS

The project is just getting started with initial promising results.

INFORMATION CONTACT

J. R. Geisman
Ohio State U. and Ohio Research & Development Center
20001 Fyffe Court
Columbus, Ohio 43210
(614) 422-5169

Pages 149 and 150 are blank.

PROJECT/TITLE

Demonstration of Oily Waste Disposal by Soil Cultivation Process

CITATION

N/A

ABSTRACT/SUMMARY

The project consisted of a series of experiments on the treatment of oily sludges (crude tank bottoms, Bunker C, intermediate wax oils) by spreading and cultivation into soil under prevailing climatic conditions. Nine test plots were operated at specific nutrient addition levels. The objectives were to determine; 1) Decomposition rates of various types of oily waste sludges. 2) Effectiveness of adding nutrient supplements. 3) Major microbiological species active in the soil. 4) Cost of the process for the disposal of oily waste. & 5) Depth of oil penetration into the soil. The demonstration phase followed a six-month pilot phase for optimization of waste loading rates and nutrient addition.

STATUS

The project was completed in 1973 after two years of testing. The results were presented at a conference in Atlanta, Ga. by Gordon Reno.
Pub: Oily Waste Disposal by Soil Cultivation Process-GPO EP1.23/2:R2-72-110 $2.00
NTIS-PB 219059

INFORMATION/CONTACT

B. Baldwin
Shell Oil Company
Deer Park, Texas 77536
(713) 479-2311

TITLE/PROJECT

Industrial Chemicals Solid Waste Generation. The Significance of Process Change, Resource Recovery, and Improved Disposal.

CITATION

Final rept. Saxton, James C.; Kramer, Marc . Arlington, Va. 6/74 155.P

ABSTRACT/SUMMARY

The study characterizes the process-related solid wastes produced during manufactures of industrial chemicals, Sic group 281. Thirty three chemicals were selected that: possess significant resource value, pose a difficult solid waste disposal problem, and/or have markedly deletericus properties, e.g., toxicity. The selected chemicals composed 40% of 1971 group output and an estimated 95% of the group's solid waste. Fifteen of the chemicals are undergoing process substitutions; in every case the newer process generates less solid waste. Most of wastes are of intrinsically low value, so resource recovery is seldom economic. Inorganics account for over 90% of total disposal cost, due to large waste volume from cre-related processes, such as alumina and phospheric acid. Organics appear to pose little disposal problem. Elimination of water discharge doubles the disposal cost of the 33 chemicals.

STATUS

Available from NTIS Pb-233 46417 pc $5.00/MF $2.25

INFORMATION CONTACT

N/A

PROJECT/TITLE

Closed Process Water - Loop in NSSC Pulp Production

CITATION

N/A

ABSTRACT/SUMMARY

The project objective is to accomplish the maximum closure of the water use loop in an integrated neutral sulfite semichemical pulp and paperboard mill by; recycling containinated process waters for direct reuse; providing a protective collection and surge system for excess surge volumes occuring during process upset conditions; providing a reverse osmosis plant to separate dissolved constituents from such excess volume as occurs, recycling the permeate so produced to replace fresh water. The separated dissolved solids will be destroyed in an existing fluid bed combustion system. A second objective of the project is to demonstrate the important results of operating with the tightly closed system on the production of NSSC paperboard. Effective techniques derived to identify and cope with problems of high dissolved solids and high temperature in the papermaking process will be developed over a year's operation of the proposed facility integrated with regular mill operations. The required techniques to stabilize operations and control ambient paper machine conditions have not yet been demonstrated in the paperboard industry.

STATUS

The project will terminate in August, 1975 after a six-month extension due to problems encountered in the reverse osmosis system. As far as closure is concerned, the project has been successful in that the BOD suspension was low in lost as far as closure. However, water removal and water balance has been a problem in the reverse osmosis process due to the removal of excess water from spasmodic events (snow, machine breakdown, etc.)

The permeate was relatively pure with the exception of acid considering the fact that there are 27 paper mills and four large communities upstream from the Fox River. The permeate is discharged into that river. According to statistics from the U. of Wisconsin and the State Agriculture Department, the river has improved since the new process has been in use.

INFORMATION/CONTACT

G. O. Walraven
Green Bay Packaging Inc.
P.O. Box 1107
Green Bay, Wisconsin 54305

TITLE/PROJECT

Waste Oil Recycling and Disposal

CITATION

N/A

ABSTRACT/SUMMARY

This publication contains information on the generation, collection and disposal of waste oil. It is a technical evaluation of current refining, and other disposal processes and an assessment (environmental) of the gaseous, liquid and solid wastes discharged from such processes. A feasibility test was conducted in a single metropolitan area for a survey designed to obtain information from service stations, waste oil collectors, and industrial users. The project also sought to obtain a national material balance to determine the ultimate fate of used oils.

STATUS

Project completed. Publication: GPO-EP1.23/2:670/2-74-052 $4.00
NTIS PB 234857/AS $6.50

INFORMATION CONTACT

N/A

PROJECT/TITLE

Food Processing Wastes

CITATION

N/A

ABSTRACT/SUMMARY

This project dealt with the wastes generated by Oregon's primary food processing industry, and involved the evaluation of waste occurrence and waste disposal systems currently being used; estimation of the extent and seriousness of present and future problems; establishment of guidelines for the selection of research which could most reasonably help alleviate the critical pollution problems; and implementation of individual research projects involving waste reduction, waste treatment, and by-product development.

The end-of-pipe flows and the discharges from unit operations were monitored for flow, pH, temperature, settleable solids, turbidity, suspended solids, total solids, coliform, total coliform, fecal streptococcus,COD, BOD and chemical concentrations. The results are expressed, where appropriate, as concentrations (e.g., mg U) and in terms of production (e.g., lb/T).

STATUS:

Information and publications may be acquired from the Food Science and Technology Department, Oregon State Univeristy.

Note:

The effluents were tested through spray irrigation methods using "guess amounts", and results of the various concentrations were recorded. Concentration results are listed for each food processing industry.

INFORMATION CONTACT

Mr. Soderquist
Food Science & Technology
Oregon State University
Corvalis, Oregon 97331
(503) 752-1141, 6719

PROJECT/TITLE

Sewage Disposal On Forest and Associated Lands

CITATION

ABSTRACT/SUMMARY

The objective of this project is to determine methods for disposal and utilization of sewage effluent and sludge on forest lands without pollution of ground and surface waters, determine the soil physical and chemical characteristics necessary for proper sewage effluent and sludge disposal and renovation on forest lands, and determine the effects of sewage effluent and sludge applications on native and exotic forest vegetation.

Municipal and industrial sewage effluents were applied to a comprehensive range of solids and forest vegetation at field locations in conjunction with municipal land disposal projects. Soil and ground water samples were analyzed for nutrient elements and for potentially toxic materials. Changes in composition in native plant communities and the growth of native and exotic plants were studied following application of chlorinated secondary sewage effluent, wastewater from sewage lagoons, and stabilized sewage sludge to forest lands.

STATUS

The project is a continuing one. Considerable data has been collected that shows that nitrogen is the major pollutant. Reports may be obtained upon request.

INFORMATION CONTACT

After 9/1/75

Stephen Nesbitt
North Central Forest Extension Service
Harrison Road
East Lansing Michigan
(616) 775-7776

PROJECT/TITLE

Effects of Spray Irrigation of Municipal Wastewater on the Rate and Total Accumulation of Heavy Metals

CITATION

N/A

ABSTRACT/SUMMARY

The specific objective of this project was to determine the total amount and rate of accumulation of selected heavy metals in several soil-vegetation ecosystems which were spray irrigated with treated municipal sewage effluent and sludge for twelve years. The proposed study was conducted at the Wastewater Renovation and Conservation Project Facility on the Pennsylvania State University farm where experimental plots were spray irrigated with various amounts and combinations of treated municipal sewage effluent and liquid digested sludge. The soil and vegetation in each area was sampled for analyses of selected heavy metals to determine the amount and rate of accumulation and to correlate these results with the application rates and vegetation cover types. Soil and foliar samples from previous years were analyzed.

STATUS

Completed.

Publication: Renovation of Secondary Effluent For Re-Use As A Water Resource
GPO-EP1.23/2:660/2-74-016 $4.80
NTIS-PB 234176

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Environmental New Town

CITATION

N/A

ABSTRACT/SUMMARY

The Mitre Corporation has been involved in the designing of an innovative city designed from the outset to be a model of environmental protection equipment and systems fabrication. The innovative city conceopts for engergy, transportation, education, communications, and waste disposal systems and in outlining site plans, city-industrial base and infrastructure, and financial implications are discussed.

STATUS

There has been several briefing sessions with HUD and other federal agencies. The project, Environmental New Town, was a joint research effort..

Information and preliminary reports are available upon request from:

INFORMATION/CONTACT

R. Riflin
Mitre Corporation
1820 Dolly Madison Blvd.
McLean, Va. 22101
(703) 790-6000

PROJECT/TITLE

Environmental Carrying Capacity as a Concept in Comprehensive Regional Planning - A Feasibility Study

CITATION

N/A

ABSTRACT/SUMMARY

In response to the need to better understand the impacts of development and management activities across entire regional systems, this research examined approaches for measuring and understanding the capacity of regional environments to absorb or support activities in such areas as resource use, land development, waste disposal, transportation, and wildlife and watershed management. The focus was upon environmental carrying capacity of regional systems and subsystems as a concept for assessing changes in environmental quality due to large-scale development, management, and planning activities and as a basis for planning and decision-making models and methods. In this regard, efforts were made to define and develop indicators for describing a region, to identify parameters necessary to design and implement models of regional carrying capacity, to assess data requirements and strategies for data collection and management, to indicate procedures for validating or testing potential models, and to identify facilities, personnel, and estimate costs for model development.

STATUS

Completed. EPA Publication #600/5-74-021 (Pending)

INFORMATION/CONTACT

Prof A. B. Bishop Civil Engineering
Utah State University
Office of Engineering, Room L50
Logan, Utah 84321

PROJECT/TITLE

Bibliography - Influence of Solid Waste Management Practices on the Environment

CITATION

N/A

ABSTRACT/SUMMARY

The objective of this continuing activity is to compile, in a readily available source, pertinent articles describing the influence of various solid waste management practices on the quality of surface water and groundwater. Such information is frequently requested from other activities within EPA and from public and private interests outside of the EPA. The work done to date has been used by Government and private engineers and scientists, to more accurately assess the impact of solid waste management practices on the environment. Primary emphasis has been in the sanitary landfill area. Two reports have been published and future work will update these basic reports. The Solid Waste Information Retrieval System is used along with other sources to perform this activity.

STATUS

The bibilography is published each June in the publication: Water Pollution Control Journal. The initial bibliography was published in June, 1970, and has been updated and revised annually since 1970.

INFORMATION/CONTACT

Dr. Dirk Brunner
U.S. Environmental Protection Agency
Natil. Environmental Research Center
5555 Ridge Ave.
Cincinnati, Ohio 45213
513-684-4487

PROJECT/TITLE

Phosphoric Acid Recovery System

CITATION

N/A

ABSTRACT/SUMMARY

This project is directed towards recovering acid and regenerating the processing solution of high acid content that is produced in bright aluminum processing. Lancy Laboratories has developed a process aiming for the separation of the acid and the aluminum content of the solution. This process promises an economical recovery of the acid and regeneration of the processing solution. Bright aluminum processing uses a solution of high acid concentration which loses its usefulness as the aluminum concentration increases.

The proposed concept has broad applications for treating waste process solutions used in the metal finishing industry. Successful demonstration of the process may have important environmental impact by significantly reducing chemical consumption and thereby reducing the waste sludges generated as well as the associated large land requirements for disposal.

Presently, 35% of the acid solution is sold to producers of fertilizer. The project is just starting up and is in the testing stage. Some laboratory data is available on request. Maximum recovery to reduce pollution is the primary goal.

STATUS

Project is ongoing. Some publications are available upon request.

INFORMATION/CONTACT

Elbert Fang EPA Cleveland Miss.	or	H. A. Lomason Douglas & Lomason Co. Detroit, Michigan 48208 (313) 873-2400

ENVIRONMENTAL IMPACT OF RESIDUAL WASTE

Section III

Part I Sludge Disposal

Part II Solid Disposal

Part III Liquid Disposal

PROJECT/TITLE

Sludge Disposal from Sulfur Dioxide and Particulate Removal Processes

CITATION

N/A

ABSTRACT/SUMMARY

Description: A study to summarize and evaluate existing data pertaining to sludge disposal. Investigate the potential methods for improving the characteristics of sludge, and recommend future testing required. The objective of the program is to evaluate the data which is available on sludge disposal and its properties so that a logical test program can be established. The scope of the program is to summarize and evaluate the available data to determine the problem areas, to summarize and evaluate the methods for improving the characteristics of sludge, and to develop a test program for improving the characteristics of sludge. Existing data pertaining to sludge disposal is summarized.

STATUS

The paper study has been completed. A small pilot plant (1,000 lbs per hr) has been built, and produces a leachate from sludge which is being tested on a small scale vegetable farm. Good results have been attained, and trace elements and toxicity studies will be performed. The leachate is being used by fertilizer producers, also. Plant production will be increased to produce 3,000 lbs of fetilizer.

INFORMATION CONTACT

B. McKinney or James Crow
U.S. Tennessee Valley Authority
Chattanooga, Tenn. 37402
(615) 755-3011

Pages 164, 165 and 166 are blank.

TITLE/PROJECT

Waste Disposal Systems for Cold Regions

CITATION

N/A

ABSTRACT/SUMMARY

The purpose of this project is to develop techniques and criteria for disposal of waste from military facilities, and for predicting, evaluating and controlling the effects of these waste on environmental quality in cold regions.

Major areas of research include treatment of wastewater by application to land as well as management of thermal and solid wastes. Significant aspects of the work with a final report will be issued upon completing of work in each problem area.

STATUS

Continuous project.

INFORMATION CONTACT

Wesley Pietkiewicz
U.S. Army
Cold Regions Research and Engineering Lab.
P.O. Box 282
Hanover , New Hampshire 03755
(603) 643-3200 ext. 243

TITLE/PROJECT

Feasibility of Using Forest Land for Sludge Disposal

CITATION

N/A

ABSTRACT/SUMMARY

This project is investigating the feasibility of using forest ecosystems to absorb nutrient additions in the form of sewage sludge. This research is important to the current problem of water pollution caused by nutrients leaching from sludge disposed of either by dumping at landfill sites or by other means that do not incorporate recycling or nutrient removal.

STATUS

Sludge from a nearby municipality and from recreation complexes in the White Mountain National Forest was landspread in June, 1975. Preliminary studies have been completed, but impact (environmental) work has just started. The project is scheduled to be completed by next summer (1976)

INFORMATION CONTACT

J. M. Hornbeck
University of New Hampshire Graduate School
Durham, New Hampshire 03824
(603) 868-5576, 9697
(603) 726-8902

PROJECT/TITLE

Using Cropland for Sewage Wastewater and Sludge Disposal. W. E. Sooper

CITATION

N/A

ABSTRACT/SUMMARY

The objective was to determine the interaction of soils and plants with sewage wastewater and sludge disposed on cropland and forestland, with emphasis on P, boron, and N reactions in the soil and with the biosphere and on the soils potential for removeing N from waste by removing denitrification; develop systems for land disposal of wastewater and sludge.

Hydrologic effects such as perched water tables, interflow and runoff were measured.

STATUS

Completed.

Publication: Conference on Recycling Treated Wastewater Through Forest and Cropland

GPO-EP1.23/2:660/2-74-003 $1.20
NTIS-PB 236313/AS

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Sewage Disposal On Forest and Associated Lands

CITATION

ABSTRACT/SUMMARY

The objective of this project is to determine methods for disposal and utilization of sewage effluent and sludge on forest lands without pollution of ground and surface waters, determine the soil physical and chemical characteristics necessary for proper sewage effluent and sludge disposal and renovation on forest lands, and determine the effects of sewage effluent and sludge applications on native and exotic forest vegetation.

Municipal and industrial sewage effluents were applied to a comprehensive range of solids and forest vegetation at field locations in conjunction with municipal land disposal projects. Soil and ground water samples were analyzed for nutrient elements and for potentially toxic materials. Changes in composition in native plant communities and the growth of native and exotic plants were studied following application of chlorinated secondary sewage effluent, wastewater from sewage lagoons, and stabilized sewage sludge to forest lands.

STATUS

The project is a continuing one. Considerable data has been collected that shows that nitrogen is the major pollutant. Reports may be obtained upon request.

INFORMATION CONTACT

After 9/1/75

Stephen Nesbitt
North Central Forest Extension Service
Harrison Road
East Lansing Michigan
(616) 775-7776

PROJECT/TITLE

Management of Forested Watershed for Water Yield Production and Wastewater Disposal - W. E. Sopper

CITATION

N/A

ABSTRACT/SUMMARY

The objectives of this study were: 1) To investigate the effects of watershed management techniques on the quantity and quality of water yield form small forested watersheds, 2) To investigate the hydrologic behavior and response of a 20 acre forested drainage basin to selected rainfall events applied with an artificial rainfall facility, and 3) To investigate the potential use of forests as disposal sites for treated municipal wastewater and sludge.

STATUS:

Completed. Publication: Conference on Recycling Treated
Municipal Wastewater Through Forest & Cropland

GPO-EP 1.23/2 660/2-74-003 $1.20
NTIS-PB 236313/AS

INFORMATION CONTACT

N/A

PROJECT/TITLE

Reclamation of Metal Values from Metal Finishing Waste Treatment Sludges

CITATION

N/A

ABSTRACT/SUMMARY

The objective of this project was to develop information on sludge volumes and characteristics produced in metal finishing plants, determine the effects of weathering on sludges in current disposal practice, and carry out bench scale investigations on potentially attractive techniques for recovering metals from these sludges. On the basis of the investigation, the process design and economics will be determined for selected metal recovery systems.

STATUS

Publication pending. Report #670/2-75-018

INFORMATION CONTACT

Ray Smithson
Battelle Memorial Institute
Columbus, Ohio
(614) 299-3151 ext. 2342

PROJECT/TITLE

Utilization and Disposal of Municipal, Industrial, and Agricultural Processing Wastes on Land

CITATION

N/A

ABSTRACT/SUMMARY

Objective: Determine factors influencing long-term utilization of wastes compatible with sustained agronomic production with emphasis on accumulation of toxic quantities of heavy metals in soils and plants.

Approach: From strip mine spoil areas, surface and core samples to water table depth will be analyzed for total pyrites, sulfides and redox potentials before and after sludge treatments. Results will be used to evaluate effectiveness of sludge in revegetation of strip mine spoils and in abatement of pollution in runoff and leaching waters. Analyses will include ph, SO(4), NO (3), Zn, Cu, Cd, Ni, Co and Pb.

PROGRESS: The field work associated with this project, the Palzo reclamation project, continues to have unavoidable delays. The ongoing research involves laboratory and greenhouse studies. The sulfur fractionation scheme was modified for sludge samples using freeze-dry techniques to remove the water phase. The Palzo strip mine spoil contains about 1.5 to 2.0 percent total sulfur, 52 percent being in the pyrite form. In the sludge about 43 percent of the S is CHCl(3) soluble and mostly in the elemental form. Adding sludge to spoil material increased the pH of the spoil from 3.2 to 5.3 initially but with 70 days of continued aeration the pH's dropped to the original level. Eh values decreased with sludge treatment. Water soluble S increased slightly and pyrite S oxidation decreased with increasing sludge applications. Continuous seration exodized less pyrite material under high sludge rates than under low application rates. High sludge applications expressed Ni and Al absorption by plants.

STATUS

The project will be in progress for another two years.

INFORMATION CONTACT

S. W. Melsted
(217) 333-1000

PROJECT/TITLE

Lime Stablized Sludge: Its Stability and Effect on Agricultural Land

CITATION

N/A

ABSTRACT/SUMMARY

An optimum system for the lime stabilization of municipal sewage sludge was first developed and evaluated. The primary objectives of this work were (1) to determine the degree of stability induced in a sludge by lime addition and (2) to determine the effects of spreading lime-stabilized sludge on agricultural land. Lime doses and contact times required to eliminate the pathogenic bacteria and odors from raw sludge were determined by laboratory studies, and the information obtained was translated into design and operational parameters for a pilot scale, continuous flow process. Physical, chemcial and biological characteristics of both the raw and stabilized sludge, were measured. Soil and crop studies, both in a greenhouse and on controlled outdoor plots, were performed to determine the effects of spreading lime-stabilized sludge. Effective lime stabilization of sludge was accomplished by elevating the pH to 12.0 with lime addition and maintaining the pH level for at least 30 minutes.

STATUS

Publication Pending 1975
#670/2-75-012

INFORMATION CONTACT

EPA
J.E. Smith, Jr.
(513) 684-8267

PROJECT/TITLE

The Role of Sewage Effluent and Sludge in the Introduction of Mercury Into Marine and Agricultural Ecosystems

CITATION

N/A

ABSTRACT/SUMMARY

The proposed work will 1) determine the significance of mecury input into the estuarine environment by effluent and sludge disposal, 2) determine and explain the variations in mercury concentration observed in sewage treatment plants, 3) determine the input of mercury to the marine system by rain and runoff, 4) continue studies on the distribution of mercury in the local (Carteret County, North Carolina) estuaries comparing a system receiving effluent (Calico Creek, Morehead City, North Carolina) with a variety of less affected areas, 5) determine the rate of mercury accumulation in marine organisms which are fed on sewage sludge, 6) determine the rate of uptake of mercury by vegetables which are grown in soil enriched with sewage sludge. Coldvapor atomic absorpiton analysis of mercury will be used.

STATUS

The project is partially finished, and the investigators state that they have a pretty clear picture of the impact of mercury in the estuarine environment. Studies are being conducted at a small town Moorehead City treatment plant (15,000 pop.). Study has shown a very distinct pattern of mercury distribution in estuaries and animals. The distribution of mercury is very restricted in distance. It remains very close to the outfall of the sewage treatment plants.

A town of comparable size and adjacent to Moorehead has one half to one third less mercury in its effluent and sludge. There are no industrial sources in either town. It is presently theorized that the mercury contamination may have come from the use of house paints containing mercury. Fungi is a problem in the area and mercury was used as an inhibitor at one time. The contamination may be resulting from storm water runoff.

INFORMATION/CONTACT

Dr. R. T. Barber
Duke U.
Marine Labo.
Beaufort, N. Carolina 28516 919-728-2111

PROJECT/TITLE

Demonstration of Oily Waste Disposal by Soil Cultivation Process

CITATION

N/A

ABSTRACT/SUMMARY

The project consisted of a series of experiments on the treatment of oily sludges (crude tank bottoms, Bunker C, intermediate wax oils) by spreading and cultivation into soil under prevailing climatic conditions. Nine test plots were operated at specific nutrient addition levels. The objectives were to determine; 1) Decomposition rates of various types of oily waste sludges. 2) Effectiveness of adding nutrient supplements. 3) Major microbiological species active in the soil. 4) Cost of the process for the disposal of oily waste. & 5) Depth of oil penetration into the soil. The demonstration phase followed a six-month pilot phase for optimization of waste loading rates and nutrient addition.

STATUS

The project was completed in 1973 after two years of testing. The results were presented at a conference in Atlanta, Ga. by Gordon Reno. Pub: Oily Waste Disposal by Soil Cultivation Process-GPO EP1.23/2:R2-72-110 $2.00
NTIS-PB 219059

INFORMATION/CONTACT

B. Baldwin
Shell Oil Company
Deer Park, Texas 77536
(713) 479-2311

PROJECT/TITLE

The Better Whey; A Dilemma

CITATION

Proceedings: Second National Symposium on Food Processing Wastes, Sidney Boxer. U.S. Environmental Protection Agency, Wash., D.C. 3/1971. pp. 409-412.

ABSTRACT/SUMMARY

The cheese industry has the problems of waste whey, a heavy pollutant because of its high BOD and yet a food by-product with excellent nutritive value. Dairy Research and Development Corporation suggests the establishment of regional whey recovery plants to treat the whey from surrounding industries since whey recovery is such an expensive process that small dairy processing plants cannot afford to install the equipment. This research and development outfit has built a demonstration plant at Vernon, New York in cooperation with Dairylea of New York. Whole whey for use as a food or food additive is recovered at this facility by spray drying, the most efficient and economical method discovered by previous research. Laval Separator Company has built the equipment for the demonstration plant. One of the major problems encountered in this project was the conversion of cottage cheese whey, which is more acidic than hard-cheese whey and more difficult to process. (D) (G)

This document is retained in the SWIRS library.

STATUS

N/A

INFORMATION CONTACT

N/A

Pages 178, 179 and 180 are blank.

TITLE/PROJECT

Waste Disposal Systems for Cold Regions

CITATION

N/A

ABSTRACT/SUMMARY

The purpose of this project is to develop techniques and criteria for disposal of waste from military facilities, and for predicting, evaluating and controlling the effects of these waste on environmental quality in cold regions.

Major areas of research include treatment of wastewater by application to land as well as management of thermal and solid wastes. Significant aspects of the work with a final report will be issued upon completing of work in each problem area.

STATUS

Continuous project.

INFORMATION CONTACT

Wesley Pietkiewicz
U.S. Army
Cold Regions Research and Engineering Lab.
P.O. Box 282
Hanover , New Hampshire 03755
(603) 643-3200 ext. 243

PROJECT/TITLE

Automated System for Water Pollution Control from an Animal Production Unit

CITATION

N/A

ABSTRACT/SUMMARY

The specific aims of the project were: 1. To continue to monitor with weekly sampling and laboratory analyses the overall performance characteristics of the plant. 2. To install, test and evaluate the performance of the aerobic digester equipment to be provided by DeLaval Comapny, or if not by them, to purchase and build a surface aerator for installation in the aerobic digester. 3. Surface aerator; submergence and speed variation in rotor; turbidity improvement of the effluent with the use of coagulants; evaluation of chlorine disinfection of the recycled effluent. 4. To automate the disposal of solids onto the nearby farm land with the use of automatically operated irrigation system. 5. To establish some monitoring stations for sampling and analyzing the water from the Loramie Creek that receives the drainage from the research farm of the Botkins Grain and Feed Company. 6. Develop an economic model of the plant to evaluate ways of making the system economically feasible.

STATUS

Completed.

The project was monitored for 3 yrs., and is reputedly the longest study of a project of this type. The report is well documented. The findings were presented in April, 1975 at a conference.

The report has been cleared for publication and is awaiting printing by EPA.

INFORMATION/CONTACT

Dr. EP Taiganides
Agricultural Engineering
614-422-6626
Ohio State University
School of Agriculture

190 N. Oval Dr., 102 Administration Bldg.
Columbus, Ohio 43210

PROJECT/TITLE

Pilot Plant Treatment of Sanitary Landfill Leachate

CITATION

N/A

ABSTRACT/SUMMARY

Treatment of leachate from landfills is a practical necessity in many cases. Where a sewerage system is available, treatment can be performed at the central plant; otherwise, treatment must be performed on-site. No performance data was available on lab, pilot, or traditional wastewater methods. This research grant effort was intended as a brief survey of treatment methods with pilot plant application of the most feasible. Detailed analyses of each method was not expected. The final outcome of this study is a practical on-site treatment scheme and an evaluation of how much leachate can be added to conventional domestic wastewater treatment plants when leachate is discharged to a sewerage system. It has been determined that a conventional biological treatment plant can accept up to 10 percent leachate-domestic wastewater without effecting plant performance significantly. The most promising on-site treatment scheme appears to be anaerobic lagooning followed by aerobic polishing. A pilot plant was established and results from this portion of work have been compiled.

The laboratory studies utilized leachate from existing landfills initially. Later, fields studies were conducted on a landfill site. It was necessary to switch to another source of leachate because of the change in the character of the effluent due to the aging of the land (pollutional components were lowered by aging). The pilot plant treated 5-10 gal. per min of leachate low-cost temporary process is needed for leachate treatment.

STATUS

Completed publication is pending from EPA

INFORMATION/CONTACT

W. C. Boyle Civil Engineering
University of Engineering
Madison, Wisconsin 53706

PROJECT/TITLE

Relationship between Topographic Position and Contamination of Water Resources by Refuse Landfills

CITATION

N/A

ABSTRACT/SUMMARY

The proposed research was based on the hypothesis that contamination characteristics of ground and surface water, caused by refuse landfills, are related to the topographic position of the refuse site. Refuse sites are located on upland and valley surfaces. Landfills may be located in the upland or loess or glacial till and in valleys, may be located on floodplains, valley walls, or in gully positions. Refuse landfills representative of the various landscape positions and representative of different ages will be stuided. Geophysical methods will be used to locate contaminated water boundaries and fill geometry. At each site bore holes were drilled, and water samples collected from them and from the adjacent stream during low flow condition. A major goal of the research was to relate topographic position with rate and direction of leachate movement and chemical characteristics of the contaminated ground and surface water. By relating these factors to landscape position characteristics of existing and potential sites can be evaluated and regulated for public safety.

STATUS

Completed. Several papers have been published in the journal Groundwater.

INFORMATION CONTACT

L. V. Sendlein
(515) 294-7814
R. C. Palmquist
(515) 294-7814

PROJECT/TITLE

Geochemical Controls on Trace Element Concentrations in Natural Waters of a Proposed Coal Ash Landfill Site

CITATION

N/A

ABSTRACT/SUMMARY

The geochemical controls on various (8) trace elements will be determined for natural waters of a proposed ash storage landfill site accompanying a coal fueled power plant to be built in N. E. Kansas. The study is the first step in evaluating the effect on water quality caused by the large amount of trace elements concentrated in the ash or volatilized during the burning of the coal when the plant is operative.

The present ranges and temporal variation of trace element concentrations will be determined in precipitation, surface, and ground waters in the drainage basins of the proposed landfill site and an adjacent small stream. The chemical constituents and properties of soils and bedrock in the two basins will be made and their controls on the addition, removal, and movement of the elements will be evaluated and compared.

STATUS

The study has been in progress for 2 yrs. during which time the natural waters have been monitored. The proposed plant is not under construction. The data that has been collected to date gives a systematic approach to the monitoring of water. The preliminary report contains data on monthly samples of water and data on 10-12 elements.

INFORMATION CONTACT

D. O. Dittemore
Kansas State Univ.
School of Arts/Dickens Hall
Manhattan, Kansas 66502
(913) 53206724

PROJECT/TITLE

Forecast of the Effects of Air and Water Controls of Solid Waste Generation
R. Stone, and D. Brows, Ralph Stone and Company, Inc. Los Angeles, Ca.

CITATION

same as Project/Title

ABSTRACT/SUMMARY

The effects of air and water pollution controls on solid waste generation were evaluated. The solid wastes from pollution control were identified for individual industries by their original air or water constituents, and the treatment process applied. The wastes were categorized by type and by location (rural or urban). Total solid wastes from pollution control activities were estimated for 1971 and projected for 1975, 1980, and 1985. Particulates and sulfur oxides were identified as the major pollutants capable of generating solid wastes when treated, suspended solids, and biological oxygen demand were identified on the principle sources for the impact of water pollution control on solid wastes.

STATUS

Publication available.
NTIS-PB 238819/AS $19.25

INFORMATION/CONTACT

Talley, R. J.
513-684-4484

PROJECT/TITLE

Environmental Flow of Cadmium and Other Trace Metals

CITATION

N/A

ABSTRACT/SUMMARY

The project consists of two major components; 1) collaborative research with industrial and waste processing facilities whose process streams contain significant amounts of cadmium, zinc, lead and other heavy metals, and 2) environmental studies to identify transport, distribution and fate cadmium, lead and zinc in the urbanized, heavily industrialized area (Northwest Indiana) bordering the southern rim of Lake Michigan.

Phase II, related to 1) above, will involve the conduct of mass balances for each source type (steel making, zinc smelting, community waste incineration; initiation of studies of control technology; study of process variability among installations of same source type. In relation to 2) above, field studies will be carried out to collect data defining metal flow patterns in impacted urban aquatic and terrestrial ecosytems.

On-site studies involve the monitoring of cadium pollution through rainfall, and air on on-site vegetation. The hydrological studies are ongoing and results have not been compiled.

DTATUS

Ongoing Project.

INFORMATION/CONTACT

Terrestrial Studies	A. W. McIntosh Tom Peton
Hydrology Studies	R. A. Greenkorn

Purdue University
Institute for Environmental Health
Engineering Dept. - Lafayette, Indiana 47907 317-494-8151

PROJECT/TITLE

Potential Solid Waste Generation and Disposal from Lime and Limestone Desulfurization Processes. R. J. Evan - Author

CITATION

N/A

ABSTRACT/SUMMARY

The generation and disposal of solid waste from electric utility plants using a lime/limestone wet-scrubbing system and the potential effects on the environment were estimated for 1975 and 1980. The study indicated that in 1975 approximately 5.8 million tons of desulfurization solid waste (50 percent solids) will be generated. In 1980, when it is estimated that desulfurization will become commercially accepted, approximately 71.4 million tons of this material will be generated for disposal and/or utilization. The desulfurization waste material, when combined with lime, fly ash, and water, may have potential for use as a roadbase material, landfill reclamation, and synthetic aggregate.

STATUS

Publication $2.25 - NTIS PB-233 975/2

INFORMATION CONTACT

N/A

PROJECT/TITLE

Sulfur Application for Land Pollution Abatement

CITATION

N/A

ABSTRACT/SUMMARY

The purpose of the project is to investigate methods for using sulfur to stabilize tailing piles to assure long-term resistance to weathering and to determine the applicability of sulfur for constructing impervious ground cover bases for sanitary landfill, leach dumps, and mill ponds.

The project is an ongoing one and has been in progress for over 14 years. The project is also aimed at cutting back on wind erosion by spray coating to hold down various materials and prevent it from blowing away. Unusual success with uranium mill tailings has been demonstrated. Spray coating has played a very significant part in holding back radon gas.

STATUS

Ongoing project. Contact will research back for information pertaining to other projects that impact upon ground and surface water upon request.

INFORMATION/CONTACT

Donald G. Kesterke or Wm. McBee
U.S. Dept. of the Interior
Bureau of Mines - 500 Date Street
Boulder City, Nevada 89005

PROJECT/TITLE

Hydrogeology of Solid Waste Disposal Sites in Northeastern Illinois

CITATION

Final rept. 1 Jun 66-31 May 68 - Hughes, G. M.; Lardon, R.A.; Farvolden R. n.

ABSTRACT/SUMMARY

The study attacks one of the problems inherent in disposing of refuse on land; the ever-present danger that unless properly engineered in a sanitary landfill--the wastes will adversely effect ground water resources. Hydrogeologic and water quality studies of five landfills in Northeastern Illinois were carried out. The distribution and concentration of dissolved solids in the concentration of dissolved solids in the vicinity of four of these landfills was found to be controlled by the configuration of the ground water flow system. The major factors influencing the attenuation of the dissolved solids appear to be the particle size of the earth materials through which they move and the distance that they move.

STATUS

Available - GPO/MF $0.95 - NTIS

INFORMATION/CONTACT

N/A

TITLE/PROJECT

Effects of Water Pollution Controls on Soild Waste Generation, 1971 to 1985: Executive Summary

CITATION

R. Stone, Ralph Stone and Company, Inc. Los Angeles, California

ABSTRACT/SUMMARY

The effects of air and water pollution controls on solid waste generation were evaluated. The solid waste from pollution control were identified for individual industrial sectors by their original air or water pollutant constituents, and the treatment process applied. The wastes were categorized by type and by location (rural or urban). Total solid waste from pollution control activities were estimated for 1971 and projected for 1985. Particulates and sulfur oxides were identified as the major air pollutants capable of generating solid wastes when treated; suspended solids and biological oxygen demand were identified as the principle means of estimating the impact of water pollution control on solid wastes.

STATUS

Publication Pending

INFORMATION CONTACT

EPA
Talley, R. J.
(513) 684-4484

PROJECT/TITLE

Demonstration of Facilities for the Treatment and Ultimate Disposal of Cattle Feedlot Wastes
Ultimate Disposal of Cattle Feedlot Wastes

CITATION

N/A

ABSTRACT/SUMMARY

Objectives of the project are: 1) To determine the effects of feedlot runoff and manure loading rates on the chemical and physical properties of soil, on the quality of runoff from the disposal area and on corn forage yields. 2) To determine the most economical loading of feedlot wastes onto land compatible with pollution control. 3) To determine the concentration of diethylstilbesterol residue in feedlot wastes and its movement through the soil profile beneath the waste disposal area.

STATUS

Project will be continuing for approximately 6 months. Several publications are available upon request.

INFORMATION/CONTACT

H. L. Manges
Kansas State University
School of Engineering/Anderson Hall
Manhattan, Kansas 66502
913-532-5580

PROJECT/TITLE

Environmental Considerations in Waste Processing and Disposal Systems.

CITATION

Malcolm Pirnie, Inc. In Central New York regional comprehensive solid waste management plan. (Albany, New York), Central New York Regional Planning and Development Board and New York State Department of Environmental Conservation, (1970). p. 1-5.

ABSTRACT/SUMMARY

The environmental aspects of waste processing and disposal are considered in this presentation of a central New York regional comprehersive solid wastes management plan which was prepared for the Central New York Regional Planning and Development Board and the New York State Department of Environmental Conservation. The following topics are considered: disposal on land (a comparison of disposal systems is presented in tabular form); potential hazards and nuisances; water quality control; air quality control (incineration, open fires, gases and odors, and dust); vector control (disease vectors include wild animals, rodents, birds, insects, and parasites); community aesthetics (blowing wastes and settlement): and the objectives of improved solid wastes management(environmental protection, improved service levels, resources recovery, and systems costs).

STATUS

This document is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Hydro- geology of Solid Waste Disposal sites in Madison, Wisconsin

CITATION

Technical rept. Kaufmann, Robert E.; Stephenson, David A. Wisconsin University, Madison. Water Resources Center

ABSTRACT/SUMMARY

Two existing, and 24 prospective, sanitary landfill sites in Madison, Wisconsin were examined. Former ground-water discharge characteristics of the existing sites have been altered as a result of the placement of fill and ground-water pumpage. Surface- and groundwater resources adjacent to landfill areas were found to receive pollutants although adverse effects were limited. Less than 5 per cent of the total organic and inorganic nitrogen and total soluble phosphorus entering Lake Monona was attributable to the landfill operation. Ground-water recharge was between 35 to 50 per cent of annual precipitation with lateral discharge to adjacent ground- and surface-water resources. The increase in dissolved chemical species was high, but restricted to local areas. Over the past 27 years, background quality in the two creeks receiving drainage changed by a 10-22 fold decrease in organic nitrogen and a 2-2.9 fold decrease in inorganic nitrogen. Phosphorus levels increased 2-6 fold. Decreased base flow and urbanization have possibly influenced these changes.

STATUS

available from - NTIS $6.00 M/F $0.95

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Environmental Impacts of the Production of Items utilizing Virgin and Recycled Ferrous Metals, Aluminumm & Plastics (Abbrev)

CITATION

N/A

ABSTRACT/SUMMARY

The purpose of this study was to analyze the environmental impacts of producing selected products utilizing virgin materials and various amounts of recycled ferrous metals, aluminum and plastics. In the initial phase of the program, determinations were made of the material and energy requirements of all stages of virgin and waste materials acquisition, transporation and processing. Also determined were the outputs of each stage, including solid, airborne, and waterborne wastes that are generated, assuming EPA air and water standards for FY 1975. The virgin and waste material systems were analyzed up to the processing point at which the materials are comparable. In the second phase of the program, the environmental impacts were examined for cases in which the selected products were made solely from virgin materials and from various amounts of virgin and waste materials. Consideration was given to air and water pollutants, solid wastes, and the amounts of material, energy and water consumed. In the final phase of the program, estimates were made of the dollar costs of controlling the environmental impacts.

STATUS

Project has been completed. Publication pending review of final draft by EPA

INFORMATION/CONTACT

R. C. Ziegler
Calspan Corporation
4455 Genesee Street
Buffalo, New York 14221
(716) 632-7500

TITLE/PROJECT

Waste Disposal Systems for Cold Regions

CITATION

N/A

ABSTRACT/SUMMARY

The purpose of this project is to develop techniques and criteria for disposal of waste from military facilities, and for predicting, evaluating and controlling the effects of these waste on environmental quality in cold regions.

Major areas of research include treatment of wastewater by application to land as well as management of thermal and solid wastes. Significant aspects of the work with a final report will be issued upon completing of work in each problem area.

STATUS

Continuous project.

INFORMATION CONTACT

Wesley Pietkiewicz
U.S. Army
Cold Regions Research and Engineering Lab.
P.O. Box 282
Hanover , New Hampshire 03755
(603) 643-3200 ext. 243

Pages 197 and 198 are blank.

PROJECT/TITLE

Automated System for Water Pollution Contrcl from an Animal Production Unit

CITATION

N/A

ABSTRACT/SUMMARY

The specific aims of the project were: 1. To continue to monitor with weekly sampling and laboratory analyses the overall performance characteristics of the plant. 2. To install, test and evaluate the performance of the aerobic digester equipment to be provided by DeLaval Comapny, or if not by them, to purchase and build a surface aerator for installation in the aerobic digester. 3. Surface aerator; submergence and speed variation in rotor; turbidity improvement of the effluent with the use of coagulants; evaluation of chlorine disinfection of the recycled effluent. 4. To automate the disposal of solids onto the nearby farm land with the use of automatically operated irrigation system. 5. To establish some monitoring stations for sampling and analyzing the water from the Loramie Creek that receives the drainage from the research farm of the Botkins Grain and Feed Company. 6. Develop an economic model of the plant to evaluate ways of making the system economically feasible.

STATUS

Completed.

The project was monitored for 3 yrs., and is reputedly the longest study of a project of this type. The report is well documented. The findings were presented in April, 1975 at a conference.

The report has been cleared for publication and is awaiting printing by EPA.

INFORMATION/CONTACT

Dr. EP Taiganides
Agricultural Engineering
614-422-6626
Ohio State University
School of Agriculture

190 N. Oval Dr., 102 Administration Bldg.
Columbus, Ohio 43210

PROJECT/TITLE

Pilot Plant Treatment of Sanitary Landfill Leachate

CITATION

N/A

ABSTRACT/SUMMARY

Treatment of leachate from landfills is a practical necessity in many cases. Where a sewerage system is available, treatment can be performed at the central plant; otherwise, treatment must be performed on-site. No performance data was available on lab, pilot, or traditional wastewater methods. This research grant effort was intended as a brief survey of treatment methods with pilot plant application of the most feasible. Detailed analyses of each method was not expected. The final outcome of this study is a practical on-site treatment scheme and an evaluation of how much leachate can be added to conventional domestic wastewater treatment plants when leachate is discharged to a sewerage system. It has been determined that a conventional biological treatment plant can accept up to 10 percent leachate-domestic wastewater without effecting plant performance significantly. The most promising on-site treatment scheme appears to be anaerobic lagooning followed by aerobic polishing. A pilot plant was established and results from this portion of work have been compiled.

The laboratory studies utilized leachate from existing landfills initially. Later, fields studies were conducted on a landfill site. It was necessary to switch to another source of leachate because of the change in the character of the effluent due to the aging of the land (pollutional components were lowered by aging). The pilot plant treated 5-10 gal. per min of leachate low-cost temporary process is needed for leachate treatment.

STATUS

Completed publication is pending from EPA

INFORMATION/CONTACT

W. C. Boyle Civil Engineering
University of Engineering
Madison, Wisconsin 53706

PROJECT/TITLE

Relationship between Topographic Position and Contamination of Water Resources by Refuse Landfills

CITATION

N/A

ABSTRACT/SUMMARY

The proposed research was based on the hypothesis that contamination characteristics of ground and surface water, caused by refuse landfills, are related to the topographic position of the refuse site. Refuse sites are located on upland and valley surfaces. Landfills may be located in the upland or loess or glacial till and in valleys, may be located on floodplains, valley walls, or in gully positions. Refuse landfills representative of the various landscape positions and representative of different ages will be studied. Geophysical methods will be used to locate contaminated water boundaries and fill geometry. At each site bore holes were drilled, and water samples collected from them and from the adjacent stream during low flow condition. A major goal of the research was to relate topographic position with rate and direction of leachate movement and chemical characteristics of the contaminated ground and surface water. By relating these factors to landscape position characteristics of existing and potential sites can be evaluated and regulated for public safety.

STATUS

Completed. Several papers have been published in the journal *Groundwater*.

INFORMATION CONTACT

L. V. Sendlein
(515) 294-7814
R. C. Palmquist
(515) 294-7814

PROJECT/TITLE

A Regional View on the Use of Land for Disposal of Municipal Sewage and Sludge.

CITATION

In Proceedings; Joint Conference on Recycling Municipal Sludges and Effluent on Land, Champaign, Illinois, July 9-13, 1973. U.S. Environmental Protection Agency, U.S. Department of Agriculture, and National Association of State Universities and Land-Grant Colleges. p. 63-66

ABSTRACT/SUMMMARY

Representatives from the U. S. Environmental Protection Agency, the U.S. Department of Agriculture, and the National Land Grant Universities held a conference in July of 1973 to identify what is known about liquid effluent and sludge application to the land, and to identify what future research is needed in this area. In this chapter, a representative from EPA Region V presents a regional overview of the use of land for the disposal of municipal sewage and sludge. The regional office becomes involved in prioritizing proposed regional research needs, monitoring demonstration projects, and conducting technology transfer activities. The practical application of new municipal waste treatment works projects is accomplished through two programs--Water Quality Management Planning and the Construction Grants Program. Also discussed are the activities being carried out under the Amended Federal Water Pollution Control Act of 1972.

STATUS

This document is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Using Cropland For Sewage Wastewater And Sludge Disposal W. E. Sopper

CITATION

N/A

ABSTRACT/SUMMARY

The objective was to determine the interaction of soils and plants with sewage wastewater and sludge disposed on cropland and forestland, with emphasis on P, boron, and N reactions in the soil and with the biosphere and on the soil's potential for removing N from wastes by denitrification; develop systems for land disposal of wastewater and sludge.

Hydrologic effects such as perched water tables, interflow and runoff were measured.

STATUS

Completed Publication: Conference on Recycling Treated Wastewater
Through Forest and Cropland
GPO-EPI.23/2:660/2-74-003 $1.20
NTIS-PB 236313/AS

INFORMATION CONTACT

N/A

PROJECT/TITLE

Sewage Disposal On Forest and Associated Lands

CITATION

ABSTRACT/SUMMARY

The objective of this project is to determine methods for disposal and utilization of sewage effluent and sludge on forest lands without pollution of ground and surface waters, determine the soil physical and chemical characteristics necessary for proper sewage effluent and sludge disposal and renovation on forest lands, and determine the effects of sewage effluent and sludge applications on native and exotic forest vegetation.

Municipal and industrial sewage effluents were applied to a comprehensive range of solids and forest vegetation at field locations in conjunction with municipal land disposal projects. Soil and ground water samples were analyzed for nutrient elements and for potentially toxic materials. Changes in composition in native plant communities and the growth of native and exotic plants were studied following application of chlorinated secondary sewage effluent, wastewater from sewage lagoons, and stabilized sewage sludge to forest lands.

STATUS

The project is a continuing one. Considerable data has been collected that shows that nitrogen is the major pollutant. Reports may be obtained upon request.

INFORMATION CONTACT

After 9/1/75

Stephen Nesbitt
North Central Forest Extension Service
Harrison Road
East Lansing Michigan
(616) 775-7776

PROJECT/TITLE

Management of Forested Watershed for Water Yield Production and Wastewater Disposal - W. E. Sopper

CITATION

N/A

ABSTRACT/SUMMARY

The objectives of this study were: 1) To investigate the effects of watershed management techniques on the quantity and quality of water yield form small forested watersheds, 2) To investigate the hydrologic behavior and response of a 20 acre forested drainage basin to selected rainfall events applied with an artificial rainfall facility, and 3) To investigate the potential use of forests as disposal sites for treated municipal wastewater and sludge.

STATUS:

Completed. Publication: Conference on Recycling Treated
Municipal Wastewater Through Forest & Cropland

GPO-EP 1.23/2 660/2-74-003 $1.20
NTIS-PB 236313/AS

INFORMATION CONTACT

N/A

PROJECT/TITLE

Pollution Control Systems for Beef Cattle and Sheep

CITATION

N/A

ABSTRACT/SUMMARY

The objective of this project is the abatement of pollution through improved systems for controlling beef cattle and sheep waste. Systems for managing wastes from housed and feedlot beef cattle and sheep will be developed and evaluated for economic abatement of air, water and soil pollution. Permanent effluent land irrigation installations will be designed for disposal or utilization runoff from a beef feedlot holding pond to complete a total feedlot runoff control system. Attention will be given to developing improved handling systems for managing the solid waste. Units will be managed, tested and improved as necessary for system optimization. The components of collection, treatment, transport and disposal will be included in the design systems. Disposal of treated effluent to land will be investigated to develop application rates for optimum crop use.

STATUS

Project is still in progress.

INFORMATION CONTACT

Conray B. Gilbertson
U.S.D.A. Meat Animal Research Center
Clay Center, Nebraska 68933
FTS 402 475-3669
(402) 472-2824

PROJECT/TITLE

The Role of Sewage Effluent and Sludge in the Introduction of Mercury Into Marine and Agricultural Ecosystems

CITATION

N/A

ABSTRACT/SUMMARY

The proposed work will 1) determine the significance of mecury input into the estuarine environment by effluent and sludge disposal, 2) determine and explain the variations in mercury concentration observed in sewage treatment plants, 3) determine the input of mercury to the marine system by rain and runoff, 4) continue studies on the distribution of mercury in the local (Carteret County, North Carolina) estuaries comparing a system receiving effluent (Calico Creek, Morehead City, North Carolina) with a variety of less affected areas, 5) determine the rate of mercury accumulation in marine organisms which are fed on sewage sludge, 6) determine the rate of uptake of mercury by vegetables which are grown in soil enriched with sewage sludge. Coldvapor atomic absorpiton analysis of mercury will be used.

STATUS

The project is partially finished, and the investigators state that they have a pretty clear picture of the impact of mercury in the estuarine environment. Studies are being conducted at a small town Moorehead City treatment plant (15,000 pop.). Study has shown a very distinct pattern of mercury distribution in estuaries and animals. The distribution of mercury is very restricted in distance. It remains very close to the outfall of the sewage treatment plants.

A town of comparable size and adjacent to Moorehead has one half to one third less mercury in its effluent and sludge. There are no industrial sources in either town. It is presently theorized that the mercury contamination may have come from the use of house paints containing mercury. Fungi is a problem in the area and mercury was used as an inhibitor at one time. The contamination may be resulting from storm water runoff.

INFORMATION/CONTACT

Dr. R. T. Barber
Duke U.
Marine Labo.
Beaufort, N. Carolina 28516 919-728-2111

PROJECT/TITLE

Closed Process Water - Loop in NSSC Pulp Production

CITATION

N/A

ABSTRACT/SUMMARY

The project objective is to accomplish the maximum closure of the water use loop in an integrated neutral sulfite semichemical pulp and paperboard mill by; recycling contaiminated process waters for direct reuse; providing a protective collection and surge system for excess surge volumes occuring during process upset conditions; providing a reverse osmosis plant to separate dissolved constituents from such excess volume as occurs, recycling the permeate so produced to replace fresh water. The separated dissolved solids will be destroyed in an existing fluid bed combustion system. A second objective of the project is to demonstrate the important results of operating with the tightly closed system on the production of NSSC paperboard. Effective techniques derived to identify and cope with problems of high dissolved solids and high temperature in the papermaking process will be developed over a year's operation of the proposed facility integrated with regular mill operations. The required techniques to stabilize operations and control ambient paper machine conditions have not yet been demonstrated in the paperboard industry.

STATUS

The project will terminate in August, 1975 after a six-month extension due to problems encountered in the reverse osmosis system. As far as closure is concerned, the project has been successful in that the BOD suspension was low in lost as far as closure. However, water removal and water balance has been a problem in the reverse osmosis process due to the removal of excess water from spasmodic events (snow, machine breakdown, etc.)

The permeate was relatively pure with the exception of acid considering the fact that there are 27 paper mills and four large communities upstream from the Fox River. The permeate is discharged into that river. According to statistics from the U. of Wisconsin and the State Agriculture Department, the river has improved since the new process has been in use.

INFORMATION/CONTACT

G. O. Walraven
Green Bay Packaging Inc.
P.O. Box 1107
Green Bay, Wisconsin 54305

PROJECT/TITLE

Effects of Spray Irrigation of Municipal Wastewater on the Rate and Total Accumulation of Heavy Metals

CITATION

N/A

ABSTRACT/SUMMARY

The specific objective of this project was to determine the total amount and rate of accumulation of selected heavy metals in several soil-vegetation ecosystems which were spray irrigated with treated municipal sewage effluent and sludge for twelve years. The proposed study was conducted at the Wastewater Renovation and Conservation Project Facility on the Pennsylvania State University farm where experimental plots were spray irrigated with various amounts and combinations of treated municipal sewage effluent and liquid digested sludge. The soil and vegetation in each area was sampled for analyses of selected heavy metals to determine the amount and rate of accumulation and to correlate these results with the application rates and vegetation cover types. Soil and foliar samples from previous years were analyzed.

STATUS

Completed.

Publication: Renovation of Secondary Effluent For Re-Use As A Water Resource
GPO-EP1.23/2:660/2-74-016 $4.80
NTIS-PB 234176

INFORMATION/CONTACT

N/A

EVALUATION OF ALTERNATIVES

Section IV

Part I	Sludge Disposal
Part II	Solid Disposal
Part III	Liquid Disposal
Part IV	Other

PROJECT/TITLE

Sludge Disposal from Sulfur Dioxide and Particulate Removal Processes

CITATION

N/A

ABSTRACT/SUMMARY

Description: A study to summarize and evaluate existing data pertaining to sludge disposal. Investigate the potential methods for improving the characteristics of sludge, and recommend future testing required. The objective of the program is to evaluate the data which is available on sludge disposal and its properties so that a logical test program can be established. The scope of the program is to summarize and evaluate the available data to determine the problem areas, to summarize and evaluate the methods for improving the characteristics of sludge, and to develop a test program for improving the characteristics of sludge. Existing data pertaining to sludge disposal is summarized.

STATUS

The paper study has been completed. A small pilot plant (1,000 lbs per hr) has been built, and produces a leachate from sludge which is being tested on a small scale vegetable farm. Good results have been attained, and trace elements and toxicity studies will be performed. The leachate is being used by fertilizer producers, also. Plant production will be increased to produce 3,000 lbs of fetilizer.

INFORMATION CONTACT

B. McKinney or James Crow
U.S. Tennessee Valley Authority
Chattanooga, Tenn. 37402
(615) 755-3011

Pages 212, 213 and 214 are blank.

PROJECT/TITLE

Waste Disposal Systems for Cold Regions

CITATION

N/A

ABSTRACT/SUMMARY

The purpose of this project is to develop techniques and criteria for disposal of waste from military facilities, and for predicting, evaluating and controlling the effects of these waste on environmental quality in cold regions.

Major areas of research include treatment of wastewater by application to land as well as management of thermal and solid wastes. Significant aspects of the work with a final report will be issued upon completion of work in each problem area.

STATUS

Continuous project.

INFORMATION CONTACT

Wesley Pietkiewicz
U.S. Army
Cold Regions Research and Engineering Lab.
P. O. Box 282
Hanover, New Hampshire 03755

PROJECT/TITLE

Using Cropland for Sewage Wastewater and Sludge Disposal. W. E. Sooper

CITATION

N/A

ABSTRACT/SUMMARY

The objective was to determine the interaction of soils and plants with sewage wastewater and sludge disposed on cropland and forestland, with emphasis on P, boron, and N reactions in the soil and with the biosphere and on the soils potential for removeing N from waste by removing denitrification; develop systems for land disposal of wastewater and sludge.

Hydrologic effects such as perched water tables, interflow and runoff were measured.

STATUS

Completed.

Publication: Conference on Recycling Treated Wastewater Through Forest and Cropland

GPO-EP1.23/2:660/2-74-003 $1.20
NTIS-PB 236313/AS

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Study of Solid Waste Management Practices in the Pulp and Paper Industry

CITATION

Final rept. Gorham International, Inc., Maine. Environmental Protection Agency, Rockville, Maryland Solid Waste Management Office, Feb. 74; 198p

ABSTRACT/SUMMARY

This report investigates and identifies present soild waste management practices, present solid waste management practices, examines alternatives, and develops strategies for future pulp and paper industry waste management. It examines waste management in five major segments of the pulp and paper industry; pulp mills, paper mills, paper board mills, and deinking mills. Data is presented on pulp and paper industry solid waste generated since 1960. A case study for each of the five major pulp and paper manufacturing segments is presented.

STATUS

Available from NTIS Pb-234 944/7 $5.50/Mf $2.25

INFORMANTION CONTACT

N/A

PROJECT/TITLE

Solid Waste Disposal

CITATION

Final rept. Phillips, Nacy P.; Wells, R. Murray, Radian Corp., Austin, Tex.

ABSTRACT/SUMMARY

The purpose of the present investigation is to identify available technologies developed in other industries that may be applicable to lime/limestone scrubber sludge disposal. Musch of the technology already developed for phosphate slimes, by-product gypsum, taconite tailings, coal ash, and acid mine drainage sludge is applicable to scrubber sludge disposal. Alternative disposal methods available for scurbber sludge, including deep mine disposal, strip-mined land reclamation, and utilization, possess some degree of potential. Based on presently available data, there are no insurmountable technological problems in disposing of scrubber sludge in an environmentally acceptable manner.

STATUS

Available from: NTIS $7.25/MF $1.45 - Pb-233 144/5

INFORMATION CONTACT

N/A

PROJECT/TITLE

Combined Sludge Processing Project

CITATION

N/A

ABSTRACT/SUMMARY

CCCSD has built an Advanced Treatment Test Facility (TTF) to treat raw sewage with lime followed by biological nitrification and denitrification at up to 2.5 MGD. The excess lime sludge is dewatered in a pair of centrifuges operated in series to separate calcium carbonate from calcium phosphate organic matter and inerts. Calcium carbonate is to be converted to recovered lime in one set of multiple heart furnaces and the residual sludge will be incinerated in another set of furnaces. This proposal documents the studies already carried out leading to the above conclusions and fills in engineering and analytical data necessary to make a complete report.

STATUS

Publication: Sludge Processing For Combined Physical-Chemical-Biological Sludges
GPO-EP 1.23/2:R2-73-250 $2.10
NTIS/PB 223 341

INFORMATION CONTACT

P. H. Caldwell
Central Contra Costa Sanitation District
Walnut Creek, California

PROJECT/TITLE

Review of Experience With Landspreading Liquid Sewage Sludge - A Bibliography

CITATION

N/A

ABSTRACT/SUMMARY

The objective of this program was to provide a critical review of existing information and operational experiences in landspreading of liquid sewage sludge. Major emphasis was given to obtaining information concerning unreported landspreading operations currently employed in this country through a telephone survey and visits to representative treatment plants and associated landspreading operations. This information was evaluated with respect to present technology, and environmental impacts from landspreading including evaluation of landspreading subsystems relating to sludge handling and conditioning modes of transport, spreading techniques, and soil and/or crop responses. Further this program also provided a summarization and an updating of sewage sludge landspreading practices found in the literature. An evaluation of the data obtained will identify deficiencies where additional studies are needed and aid in the development of proper design criteria for landspreading systems.

The investigator found that only 3 or 4 sewage treatment plants had a water quality program. There is a lack of intensive monitoring of waste programs, though there is an abundance of field work being done.

Research revealed that approximately 400 plants in the five most populous regions in the U.S. have been landspreading sewage sludge without monitoring for over 50 years.

The completed bibliography contains short histories with annotated bibliographies of 25 treatment plants visited by the researchers.

STATUS

Project is completed and publication is expected in August, 1975

INFORMATION CONTACT:

Office of Research Monitoring
G. K. Dotson
NERC - Cinn., Ohio

PROJECT/TITLE

West Shade River Abatement Demonstration Project

CITATION

N/A

ABSTRACT/SUMMARY

The concepts of sand abatement, strip-mine reclamation and mine-acid control are the objectives of the project. The demonstration project will seek to how the use of sludge, fertilizing, liming and other minor techniques will permit the growth and self-regeneration of various grasses, shrubs and trees.

The demonstration project is being conducted in Meigs County, Ohio, which is a part of Appalachia. Severe erosion problems occurring in certain strip-mine areas can be eliminated or controlled utilizing methods and materials which have been researched. Sand erosion from high walls and spoil banks causes considerable property loss due to the deposition of sand over once-tillable soils and the clogging of existing waterways.

One of the problems encountered in this project is the distance from which the sludge had to be transported. The transportation of sludge from the waste treatment facility to the Appalachian hills is expensive.

STATUS

A final report is pending.

INFORMATION/CONTACT

Appalachian Regional Commission or

C. Meir
State Department of Natural Resources
Columbus, Ohio 43212
(614) 466-2066

PROJECT/TITLE

System Alternatives in Oxygen Activated Sludge

CITATION

N/A

ABSTRACT/SUMMARY

An oxygen activated sludge system with co-current contacting of oxygen and mixed liquor in a plug flow reactor was operated on District of Columbia primary effluent during a two-year period over a wide range of loading (F. M. 0.26 to 2.0) with Solids Retention Times (SRT) from 2.0 to 13.0 days at the EPA-DC Pilot Plant.

STATUS

Publication Pending

INFORMATION CONTACT

EPA
D. F. Bishop
(513) 684-8353

PROJECT/TITLE

Effective Utilization of Municipal and Utility Sludges and Ashes

CITATION

N/A

ABSTRACT/SUMMARY

The object of the project was to: 1) Perform a comprehensive literature review and survey of the present municipal and utility sludge and ash production, disposal methods and utilization methods. 2) Determine technical feasibility and economic practicality of more widespread application of present utilization methods. 3) Suggest new utilization methods with consideration of technical feasibility and economic practicality. A search of the literature and contact with a variety of governmental and trade organizations who are producers and/or present or potential users of sludges and ashes were conducted.

STATUS

Completed Publication is pending.
Characterization and Utilization of Municipal and Utility Sludges and Ashes.
Vol. 1
EPA # 670/2-75-033 a, b, c, & d

INFORMATION CONTACT

N/A

PROJECT/TITLE

Sludge Processing, Transportation, and Disposal/Resource Recovery; Planning Perspective

CITATION

N/A

ABSTRACT/SUMMARY

A methodology was developed in this report for use in the 208 planning process for the evaluation of alternatives for the ultimate disposal of residual wastes generated in municipal wastewater treatment plants. This methodology considered technical, economic, social, and institutional factors pertinent to a thorough review of alternatives.

Residual wastes generated in municipal wastewater treatment plants were characterized. Handling and treatment processes for the residual wastes were discussed and evaluated in light of qualitative and quantitative changes to the residual wastes. Liquid, gaseous, and solid sidestreams produced in residual waste treatment were evaluated and rail, pipeline, barge, and truck transport of residual wastes were analyzed.

Environmental, operational, and institutional constraints to the use of ocean disposal, lagoons, sanitary landfills, sludge recycling, and land reclamation were presented.

STATUS

Completed in Feb. 1975 - EPA Publication - Contract # 68-01-3104
Publication Pending

INFORMATION CONTACT

Dr. Dean Neptune
Water Planning Division/Planning Assistance
401 M St. S.W.
Wash. D.C. 20460
(202) 426-2474

PROJECT/TITLE

Effective Utilization of Municipal and Utility Sludges and Ashes

CITATION

N/A

ABSTRACT/SUMMARY

The object of the project was to: 1) Perform a comprehensive literature review and survey of the present municipal and utility sludge and ash production, disposal methods and utilization methods. 2) Determine technical feasibility and economic practicality of more widespread application of present utilization methods. 3) Suggest new utilization methods with consideration of technical feasibility and economic practicality. A search of the literature and contact with a variety of governmental and trade organizations who are producers and/or present or potential users of sludges and ashes were conducted.

STATUS

Completed Publication is pending.
Characterization and Utilization of Municipal and Utility Sludges and Ashes.
Vol. 1
EPA # 670/2-75-033 a, b, c, & d

INFORMATION CONTACT

N/A

Pages 226, 227 and 228 are blank.

PROJECT/TITLE

Survival and Movement of Viruses in Landfilled Solid Waste

CITATION

N/A

ABSTRACT/SUMMARY

The objectives of this project are to determine the survival patterns of viral pathogens in landfilled solid waste and to evaluate the potential contamination of water resources through leaching of viruses from a waste disposal site . Microbiologic monitoring leachates from Cells #1 and #2 is being conducted in order to determine the degree of health hazard involved in solid waste disposal by landfilling. The results so far indicate that poliovirus may survive in compacted solid waste for at least 13 days at temperatures of 68-80 degrees F but the virus is inactivated in 2-4 days in a landfill with temperatures ranging from about 120-140 degrees F.

STATUS

Project was completed. Final report has been wirtten and is awaiting EPA review and publication.

INFORMATION CONTACT

Merzda Peterson
Research Triangle Park
Durham, North Carolina

PROJECT/TITLE

Pilot Plant Treatment of Sanitary Landfill Leachate

CITATION

N/A

ABSTRACT/SUMMARY

Treatment of leachate from landfills is a practical necessity in many cases. Where a sewerage system is available, treatment can be performed at the central plant; otherwise, treatment must be performed on-site. No performance data was available on lab, pilot, or traditional wastewater methods. This research grant effort was intended as a brief survey of treatment methods with pilot plant application of the most feasible. Detailed analyses of each method was not expected. The final outcome of this study is a practical on-site treatment scheme and an evaluation of how much leachate can be added to conventional domestic wastewater treatment plants when leachate is discharged to a sewerage system. It has been determined that a conventional biological treatment plant can accept up to 10 percent leachate-domestic wastewater without effecting plant performance significantly. The most promising on-site treatment scheme appears to be anaerobic lagooning followed by aerobic polishing. A pilot plant was established. Results from this portion of work have be compiled.

The laboratory studies utilized leachate from existing landfills initially. Field studies were conducted on a landfill site. The leachate was pumped out and treated. It was necessary to switch to another source of leachate because of the change in the character of the effluent due to the aging of the land (pollutional components were lowered by aging). The pilot plant treated 5-10 gal. per min of leachate. A low cost temporary process is needed.

STATUS

Completed. Publication is pending for EPA

INFORMATION/CONTACT

W. C. Boyle - Civil Engineering
University of Wisconsin
School of Engineering
Madison, Wisconsin 53706

PROJECT/TITLE

Demonstration of Non-Aqueous Sewage Disposal System for Recreational and Remote Areas

CITATION

N/A

ABSTRACT/SUMMARY

The overall objective was to demonstrate the feasibility and effectiveness of using a compact, closed-loop, non-aqueous system for collecting, transporting and disposing of domestic waste at remote and recreational areas where conventional methods of disposal are undesirable because of needs to protect recreational and underground waters and in areas where water is in short supply. It will be demonstrated that water conservation is acheived since a non-aqueous flush media will be utilized. The system was demonstrated and evaluated during both winter and summer seasons at a facility serving the recreational and tourist industry. The physical, biological, pathological, chemical and aesthetic characteristics of the flush media was demonstrated. Specific technical data determined and evaluated included: 1) Data on the useful life of the flush media, 2) Per capita waste loading to establish future design criteria, 3) Effectiveness of the incineration process, 4) Operational maintenance and reliability data to project optimum operational techniques and procedures.

STATUS

EPA Publication Pending 670/2-73-088

INFORMATION CONTACT

N/A

PROJECT/TITLE

Techniques for Disposal of Wastes from Fruit and Vegetable Processing Plants

CITATION

N/A

ABSTRACT/SUMMARY

Objectives: Evaluate methods for disposing or reducing saline wastes from food processing operations. Develop techniques for utilizing or reducing solid and liquid wastes from food processing plants. Determine whether pesticide residues, if present, can be reduced in or removed from food processing wastes.

Approach: The wastes will be subjected to separation, extraction of various components, dehydration or fermentation, submerged combustion, and other chemical treatments, where applicable. The main commodity wastes will include cucumbers, cabbage and tomatoes.

Progress: Progress has been made in water reuse thereby reducing the total volume for disposal. Solid wastes are high in protein and have no antinutritional factors. Cucumbers cured in recycled brine were as good as or slightly better than those cured in fresh brine. Recycled brine was filtered and used for fresh pack pickles.

The final effluent is disposed of in lagoons. Spray irrigation of the effluenton fields is now being tested.

STATUS

The project is just getting started with initial promising results.

INFORMATION CONTACT

J. R. Geisman
Ohio State U. and Ohio Research & Development Center
20001 Fyffe Court
Columbus, Ohio 43210
(614) 422-5169

PROJECT/TITLE

Evaluation of a Solid-Waste Disposal Site

CITATION

N/A

ABSTRACT/SUMMARY

Cortland County has proposed at landfill operation for disposal of solid-wastes in the near future. Substantial base line geologic and hydrologic data on the proposed site has been collected, and an array of 50 shallow wells has been emplaced and monitored on a weekly basis since April, 1973.

The primary objectives of this study are: (1) to determine in more detail the hydrologic regime of the landfill site and existent water quality, and (2) to evaluate the effect of landfill operations on this regime over an extended period of time.

The proposed study is particularly significant because considerable geologic and hydrologic parameters can be determined and monitored prior to landfill operation. Continuation of this study after initiation of landfill operations are expected to provide a critical evaluation of the sanitary landfill as a viable means of solid-waste disposal.

The proposed study basically involves the establishment and maintenance of a monitoring program for critical weather, hydrologic, and geologic parameters. Data thus obtained will determine the impact of landfill operations on the natural hydrogeologic environment of this area and adjacent parts of New York and Pennsylvania.

STATUS

Continuing Project.
Articles and publication are available upon request

INFORMATION CONTACT

Dr. T. E. Bugh
State University of New York - School of Arts
Cortland, New York 13045

PROJECT/TITLE

Building an Amphitheater and Coasting Ramp of Municipal Solid Waste. Volumes I and II

CITATION

Final rept. Beck, William M. Jr.

ABSTRACT/SUMMARY

By 1966, disposing of solid wastes in the City of Virginia Beach, Virginia had become a critical problem. At the same time the number of residents and tourists was increasing each year, thus requiring that more solid waste be disposed of, land values were also rising. This latter factor dictated against using land suitable for residential, commercial, or recreational purposes for solid waste disposal. In addition, the presence of high water table (5-8 ft) makes deep pit excavation impractical. The concept was advanced that an existing dump located on relatively inexpensive land be converted into a recreational site by building a 65-foot hill of solid waste. Provision would be made for a 10,000 seat amphitheater, a soap box derby ramp, a fresh water lake, and parking facilities. Details are presented on design and construction techniques, operating procedures, equipment used, problems encountered, water and gas sampling methods, economic factors, and public reaction.

STATUS

Available from NTIS $6.50/MF $1.45

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Sulfur Application for Land Pollution Abatement

CITATION

N/A

ABSTRACT/SUMMARY

The purpose of the project is to investigate methods for using sulfur to stabilize tailing piles to assure long-term resistance to weathering and to determine the applicability of sulfur for constructing impervious ground cover bases for sanitary landfill, leach dumps, and mill ponds.

The project is an ongoing one and has been in progress for over 14 years. The project is also aimed at cutting back on wind erosion by spray coating to hold down various materials and prevent it from blowing away. Unusual success with uranium mill tailings has been demonstrated. Spray coating has played a very significant part in holding back radon gas.

STATUS

Ongoing project. Contact will research back for information pertaining to other projects that impact upon ground and surface water upon request.

INFORMATION/CONTACT

Donald G. Kesterke or Wm. McBee
U.S. Dept. of the Interior
Bureau of Mines - 500 Date Street
Boulder City, Nevada 89005

PROJECT/TITLE

Flyash Disposal

CITATION

N/A

ABSTRACT/SUMMARY

This project involved the disposal of flyash as a slurry in a worked out mine. The resultant mixture of slurry water and mine water were chemically treated before discharge to a stream. This project has been in existence for the past five years and is scheduled to continue for another 5 years.

The dissolved salts in the discharge has dropped from 3000 PPI to 2000 PPI to date. Research is continuing to reduce the salt content to 1500 PPI or lower. The state of Penn. treats the discharge as a process rather than a mine effluent. The present PPI would be allowable if the discharge was treated as mine drainage. However, the mechanism is working well, and research will continue.

STATUS

Ongoing Project. Information will be sent upon request.

INFORMATION CONTACT

Mr. Robert O'Hare
Mr. Nelson Tonet
Duquesne Light Company
435 6th Avenue
Pittsburgh, Pa. 15219

PROJECT/TITLE

Evaluation of Components and Systems for Handling Waste From Housed Swine

CITATION

N/A

ABSTRACT/SUMMARY

The objective of this project is to reduce the pollution potential of housed swine through improved waste systems. Alternative methods of collection, treatment, transport and disposal of waste from housed swine will be developed and evaluated as component parts of a total system for economic reduction of the pollution potential of waste from all phases of swine production. Major components of systems will be evaluated, improved, and combined for development of optimum total systems. Evaluations will be based on labor, initial and operating costs, effects on livestock production, and degree of control over pollution of air, waste and soil.

STATUS

Project is still in progress

INFORMATION/CONTACT

Conray B. Gilbertson
U.S.D.A. Meat Animal Research Center
Clay Center, Nebraska 68933
FTS 402 475-3669
(420) 472 2874

PROJECT/TITLE

Annotated Bibliography on Hospital Solid Wastes Collection Treatment and Disposal

CITATION

N/A

ABSTRACT/SUMMARY

The project consisted of compiling an annotated bibliography of the available literature on hospital solid waste collection, treatment, and disposal systems. Literature on microbiological or health aspects related to the various systems is included.

STATUS

The project is completed. Publications may be obtained from EPA (Publication EP #00458-02S1)

INFORMATION CONTACT

Oscar Albrecht, Project Officer
Solid and Hazardous Waste Research Laboratory
National Environmental Research Center
Cincinnati, Ohio 45268

PROJECT/TITLE

Suspended Solids Monitor

CITATION

J. W. Liskowitz, G. J. Francey, and J. Tarzynski, American Standards, Inc. New Brunswick, N. Jersey

ABSTRACT/SUMMARY

A method for measuring concentration of suspended solids in liquid media, based on depolarization of backscattered polarized light, has been developed and instrumented. Feasibility studies and field evaluation of the instrument, using sewage influent, effluent and sludge, showed that there is a specific relationship between concentration of solid particles and polarization ratio. It was also shown that the relationship is independent of size distribution and density of particles, color of particles or solution, sludge consistency, velocity, and build-up of solids on the optical window. The field evaluation results indicate that this instrument provides a continuous instantaneous in situ measurement of suspended solids concentrations in combined sewers and other wastewater flows. This report was submitted in fulfillment of Project No. 11024DZB, Contract No. 14-12-494 by American Standard Inc. under the sponsorship of the U.S. Environmental Protection Agency. Work was completed in August, 1970.

STATUS

Completed in August 1970. Publication pending.

INFORMATION/CONTACT

Field, R.
201-548-3503

PROJECT/TITLE

Waste Disposal Systems for Cold Regions

CITATION

N/A

ABSTRACT/SUMMARY

The purpose of this project is to develop techniques and criteria for disposal of waste from military facilities, and for predicting, evaluating and controlling the effects of these waste on environmental quality in cold regions.

Major areas of research include treatment of wastewater by application to land as well as management of thermal and solid wastes. Significant aspects of the work with a final report will be issued upon completion of work in each problem area.

STATUS

Continuous project.

INFORMATION CONTACT

Wesley Pietkiewicz
U.S. Army
Cold Regions Research and Engineering Lab.
P. O. Box 282
Hanover, New Hampshire 03755

Pages 241 and 242 are blank.

PROJECT/TITLE

Survival and Movement of Viruses in Landfilled Solid Waste

CITATION

N/A

ABSTRACT/SUMMARY

The objectives of this project are to determine the survival patterns of viral pathogens in landfilled solid waste and to evaluate the potential contamination of water resources through leaching of viruses from a waste disposal site . Microbiologic monitoring leachates from Cells #1 and #2 is being conducted in order to determine the degree of health hazard involved in solid waste disposal by landfilling. The results so far indicate that poliovirus may survive in compacted solid waste for at least 13 days at temperatures of 68-80 degrees F but the virus is inactivated in 2-4 days in a landfill with temperatures ranging from about 120-140 degrees F.

STATUS

Project was completed. Final report has been wirtten and is awaiting EPA review and publication.

INFORMATION CONTACT

Merzda Peterson
Research Triangle Park
Durham, North Carolina

PROJECT/TITLE

Techniques for Disposal of Wastes from Fruit and Vegetable Processing Plants

CITATION

N/A

ABSTRACT/SUMMARY

Objectives: Evaluate methods for disposing or reducing saline wastes from food processing operations. Develop techniques for utilizing or reducing solid and liquid wastes from food processing plants. Determine whether pesticide residues, if present, can be reduced in or removed from food processing wastes.

Approach: The wastes will be subjected to separation, extraction of various components, dehydration or fermentation, submerged combustion, and other chemical treatments, where applicable. The main commodity wastes will include cucumbers, cabbage and tomatoes.

Progress: Progress has been made in water reuse thereby reducing the total volume for disposal. Solid wastes are high in protein and have no antinutritional factors. Cucumbers cured in recycled brine were as good as or slightly better than those cured in fresh brine. Recycled brine was filtered and used for fresh pack pickles.

The final effluent is disposed of in lagoons. Spray irrigation of the effluent on fields is now being tested.

STATUS

The project is just getting startea with initial promising results.

INFORMATION CONTACT

J. R. Geisman
Ohio State U. and Ohio Research & Development Center
20001 Fyffe Court
Columbus, Ohio 43210
(614) 422-5169

PROJECT/TITLE

Demonstration of Non-Aqueous Sewage Disposal System for Recreational and Remote Areas

CITATION

N/A

ABSTRACT/SUMMARY

The overall objective was to demonstrate the feasibility and effectiveness of using a compact, closed-loop, non-aqueous system for collecting, transporting and disposing of domestic waste at remote and recreational areas where conventional methods of disposal are undesirable because of needs to protect recreational and underground waters and in areas where water is in short supply. It will be demonstrated that water conservation is acheived since a non-aqueous flush media will be utilized. The system was demonstrated and evaluated during both winter and summer seasons at a facility serving the recreational and tourist industry. The physical, biological, pathological, chemical and aesthetic characteristics of the flush media was demonstrated. Specific technical data determined and evaluated included: 1) Data on the useful life of the flush media, 2) Per capita waste loading to establish future design criteria, 3) Effectiveness of the incineration process, 4) Operational maintenance and reliability data to project optimum operational techniques and procedures.

STATUS

EPA Publication Pending 670/2-73-088

INFORMATION CONTACT

N/A

PROJECT/TITLE

Using Cropland for Sewage Wastewater and Sludge Disposal. W. E. Sooper

CITATION

N/A

ABSTRACT/SUMMARY

The objective was to determine the interaction of soils and plants with sewage wastewater and sludge disposed on cropland and forestland, with emphasis on P, boron, and N reactions in the soil and with the biosphere and on the soils potential for removeing N from waste by removing denitrification; develop systems for land disposal of wastewater and sludge.

Hydrologic effects such as perched water tables, interflow and runoff were measured.

STATUS

Completed.

Publication: Conference on Recycling Treated Wastewater Through Forest and Cropland

GPO-EP1.23/2:660/2-74-003 $1.20
NTIS-PB 236313/AS

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Lake Hope Drainage Demonstration Project

CITATION

N/A

ABSTRACT/SUMMARY

Description: The purpose of the Lake Hope project is to demonstrate the reduction of acid mine drainage pollution by the removal of coal refuse, and the construction of bulkhead seals to flood underground mine workings and thus prevent the formation of acid. The Lake Hope site was chosen for the demonstration project because acidic drainage from abandoned coal mines in the watershed above Lake Hope has severely restricted waste oriented activity in this prime recreational area. A total of 107 mine openings has been noted. The combined acid discharge from these openings is over 700,000 pounds per year. A multiphase mine drainage abatement demonstration program is recommended with major elements including: Removal and/or burial of coal refuse which was scattered throughout the area during active mining operations; sealing of about 50 mine openings.

STATUS

Several standard bulkheads, and one innovative, but not new, bulkhead were used. The dirt was stripped from the hillside at the site of the mine openings. A clay dam was constructed and the stripped dirt was used to re-cover the hillside, thus sealing in the acid mine leakage. It is expected that before the end of 1975, the engineering design phase will be completed. Fifty mines have been cleared of coal refuse and sealed to date.

A feasibility study is pending publication. EPA-R2-73-151 Lake Hope Drainage Demonstration Project.

INFORMATION/CONTACT

WC Roman
Division of Planning
Fountain Sq. 43224
(614) 466-2333

PROJECT/TITLE

Closed Process Water - Loop in NSSC Pulp Production

CITATION

N/A

ABSTRACT/SUMMARY

The project objective is to accomplish the maximum closure of the water use loop in an integrated neutral sulfite semichemical pulp and paperboard mill by; recycling contaiminated process waters for direct reuse; providing a protective collection and surge system for excess surge volumes occuring during process upset conditions; providing a reverse osmosis plant to separate dissolved constituents from such excess volume as occurs, recycling the permeate so produced to replace fresh water. The separated dissolved solids will be destroyed in an existing fluid bed combustion system. A second objective of the project is to demonstrate the important results of operating with the tightly closed system on the production of NSSC paperboard. Effective techniques derived to identify and cope with problems of high dissolved solids and high temperature in the papermaking process will be developed over a year's operation of the proposed facility integrated with regular mill operations. The required techniques to stabilize operations and control ambient paper machine conditions have not yet been demonstrated in the paperboard industry.

STATUS

The project will terminate in August, 1975 after a six-month extension due to problems encountered in the reverse osmosis system. As far as closure is concerned, the project has been successful in that the BOD suspension was low in lost as far as closure. However, water removal and water balance has been a problem in the reverse osmosis process due to the removal of excess water from spasmodic events (snow, machine breakdown, etc.)

The permeate was relatively pure with the exception of acid considering the fact that there are 27 paper mills and four large communities upstream from the Fox River. The permeate is discharged into that river. According to statistics from the U. of Wisconsin and the State Agriculture Department, the river has improved since the new process has been in use.

INFORMATION/CONTACT

G. O. Walraven
Green Bay Packaging Inc.
P.O. Box 1107
Green Bay, Wisconsin 54305

PROJECT/TITLE

Improved Waste-Treatment System Design Based on the Natural Thermal Environment

CITATION

N/A

ABSTRACT/SUMMARY

Low-maintenance, technology-simple (LMTS) waste treatment systems (systems having minimal dependence on electrical and mechanical equipment) offer an attractive alternative to technology-intensive, package plants currently being used to treat wastewaters from subdivisions and isolated recreational areas. Although package plants are advertised to perform satisfactorily with a minimum of operational control, experience has shown that they are subject to serious operational and performance problems.

The objective of the proposed research is to establish procedures with which the engineer can make a rational design of a LMTS waste treatment system based on (1) easily obtained meteorological data and (2) effluent standards applicable to the location of the system. This objective will be achieved by: 1. the definition and formulation of the time-varying thermal characteristics of that portion of the earth's surface extending from the surface to a depth of approximately 10 meters, 2. the characterization of domestic wastewater temperatures, 3. the application of recent research related to temperature effects on biological processes to the design of LMTS treatment units, and 4. the evaluation of the predicted characteristics of these units in light of current and anticipated effluent standards.

STATUS

The project is a 2 yr. project. The investigators have just completed one year and have designed a biological process sensitive to temperature.

INFORMATION/CONTACT

Dr. L. G. Rich
Clemson University School of Engineering
Rhodes Research Building
Clemson, South Carolina 29631
803-656-3201 ext. 3276

PROJECT/TITLE

Upgrading Wastewater Stabilization Ponds to Meet New Discharge Standards
by E. J. Middlebrooks, D. H. Falkenborg, R. F. Lewis, and D. J. Ehreth,
Utah State University Logan, Utah

CITATION

same as PROJECT/TITLE

ABSTRACT/SUMMARY

The question as to whether lagoons, as they now exist, meet the new secondary treatment standards and what methods would work to upgrade lagoon treatment in cases where they presently do not meet the standards is of high priority for many Regional Offices of EPA. The symposium was held for EPA staff and State Officials to review the Office of Research and Development's program for upgrading lagoons. The intermittent sand filter, land application of algae laden effluents and the submerged rock filter offer good potential for cost effective upgrading. The basic biology of the treatment mechanism, disinfection technology, the controlled discharge operation (and results), cost effective analysis, and new fields of research were covered by speakers. Intermittent sand filtration, submerged rock filtration, and land application of sewage effluents are effective alternatives to removing algae from sewage lagoons.

STATUS

Publication Pnding
670/9-75-004

INFORMATION CONTACT

E. J. Middlebrooks
D. H. Falkenborg
Utah State University
Logan, Utah

PROJECT/TITLE

Alternative Systems for Supplying Dissolved Oxygen in Wastewater Treatment by R. Smith and W. F. McMichael, Advanced Waste Treatment Research Laboratory, EPA Cincinnati, Ohio.

CITATION

Alternative Systems for Supplying Dissolved Oxygen in Wastewater Treatment by R. Smith and W. F. McMichael, Advanced Waste Treatment Research Laboratory, EPA Cincinnati, Ohio.

ABSTRACT/SUMMARY

Various alternative systems for supplying oxygen to wastewater treatment processes were studied and evaluated in terms of cost and effectiveness. Systems which deliver atmospheric air to the process such as diffused aeration, mechanical aeration, and turbine aeration are compared to systems which deliver pure oxygen gas. The relationship between oxygen consumption and excess sludge production in the activated sludge process is quantified. Factors such as the diurnal variation in oxygen demand and the oxygen demand as a function of distance along the aerator in the activated sludge process are studied. Finally, the total cost for oxygen supply expressed as cents per pound of oxygen dissolved in the wastewater is estimated as a function of total oxygen consumption expressed as tons of oxygen used per day. The least costly system was found to be mechanical aeration. The pure oxygen system was found to cost roughly the same as a diffused air system with an aeration efficiency of 54%.

STATUS

Publication pending
#670/2-75-001

INFORMATION/CONTACT

EPA
Smith R.
513-684-8352

PROJECT/TITLE

Pilot Plant Treatment of Sanitary Landfill Leachate

CITATION

N/A

ABSTRACT/SUMMARY

Treatment of leachate from landfills is a practical necessity in many cases. Where a sewerage system is available, treatment can be performed at the central plant; otherwise, treatment must be performed on-site. No performance data was available on lab, pilot, or traditional wastewater methods. This research grant effort was intended as a brief survey of treatment methods with pilot plant application of the most feasible. Detailed analyses of each method was not expected. The final outcome of this study is a practical on-site treatment scheme and an evaluation of how much leachate can be added to conventional domestic wastewater treatment plants when leachate is discharged to a sewerage system. It has been determined that a conventional biological treatment plant can accept up to 10 percent leachate-domestic wastewater without effecting plant performance significantly. The most promising on-site treatment scheme appears to be anaerobic lagooning followed by aerobic polishing. A pilot plant was established and results from this portion of work have been compiled.

The laboratory studies utilized leachate from existing landfills initially. Later, fields studies were conducted on a landfill site. It was necessary to switch to another source of leachate because of the change in the character of the effluent due to the aging of the land (pollutional components were lowered by aging). The pilot plant treated 5-10 gal. per min of leachate low-cost temporary process is needed for leachate treatment.

STATUS

Completed publication is pending from EPA

INFORMATION/CONTACT

W. C. Boyle Civil Engineering
University of Engineering
Madison, Wisconsin 53706

PROJECT/TITLE

Solid Waste Management Technology Assessment

CITATION

Boothe, W.A.; General Electric Corporate Research and Development, Schenectady, N. Y.; Dec. 74; 367p

ABSTRACT/SUMMARY

This report contains a thorough analysis of all the methods for processing and disposing of solid waste currently in use or being considered. It includes not only the conventional disposal processes such as land fill, composting, and incineration but also the newer resource recovery technologies such as pyrolysis, material and energy recovery which are now emerging from the laboratory. In addition to analysis of complete processes, discussions on the merits or key pieces of equipment such as shredders, air separators, and conveyors are also included. The analysis includes a description of the technical features of each process and how it works, a review of operating history and experience to date, and estimates of both capital and operating costs as well as scale-up considerations. Numerous tables are provided which allow ready comparison of competing processes in terms of net energy recovered, effluents, weight of materials to be land filled, etc.

STATUS

Publication available. NTIS PB-238 144/OS1

[illegible] INFORMATION/CONTACT

N/A

TITLE/PROJECT

Environmental New Town

CITATION

N/A

ABSTRACT/SUMMARY

The Mitre Corporation has been involved in the designing of an innovative city designed from the outset to be a model of environmental protection equipment and systems fabrication. The innovative city concepts for energy, transportation, education, communications, and waste disposal systems and in outlining site plans, city-industrial a base and infrastructure and financial implications are discussed.

STATUS

There has been several briefing sessions with HUD and other federal agencies. The project, Environmental New Town, was a joint research effort.

Information and preliminary reports are available upon request from:

INFORMATION/CONTACT

R. Rifkin
Mitre Corporation
1820 Dolly Madison Blvd.
McLean, Va. 22101
703-790-6000

Pages 255 and 256 are blank

PROJECT/TITLE

Joint Siting of Electrical Power Plant and Advanced Wastewater Treatment Plant Feasibility Study

CITATION

N/A

ABSTRACT/SUMMARY

Description: The purpose of this study was to evaluate five advanced wastewater treatment (AWT) plant sites and various treatment processes, including land disposal and sludge. Joint siting of an electrical power plant and an AWT plant was considered because of the possibility of reducing the overall envrionmental impact as compared to separate siting. Alternatives affiliated with the power plant include the following: location of the AWT plant at the power plant site, using clear effluent as make up to the power plants cooling towers and burning the AWT plant's organic solids in the power plant's furnaces; locating the AWT plant at a lower basin site with clear water transmitted to the power plant and alternate methods sludge disposal; land disposal of sludge in connection with the power plant's use of partially treated wastewater. The study concludes that to meet the quality standards, for discharges into the Potomac River, treatment processes are limited to AWT or land disposal. Land disposal requires considerably more land than an AWT plant and would consequently cost more and displace more families. For those and other reasons, an AWT plant is recommended. The joint location of the AWT plant and the power plant proved to have many advantages and to be entirely feasible and acceptable from the technical, economic, and environmental viewpoints. However, due to community reaction and sociopolitical factors, the joint siting project was rejected by the governing body. Plant is under design and is nearly completed. Construction is scheduled for next year. (1976)

STATUS

A detailed environmental impact study of an Areawide Waste Treatment and Delivery System for Montogomery County, Md. was done by Battelle Memorial in August 1974. Region 3 is working to complete a similiar draft for the Region 3 area.

INFORMATION/CONTACT

Bob Ewing
Battelle Memorial Research
505 King Avenue
Columbus, Ohio 43201
Montogomery County E.I.S.

J.W. Filbert
Cornell, Howland, Hayes & Merry
1930 Issac Newton Sq. Rm 202
Herrdon, Va. 22070
703-471-9710
Region 3

PROJECT/TITLE

Framework for Analyzing and Selecting Among Alternativesfor Regional Solid Waste Management

CITATION

N.A

ABSTRACT/SUMMARY

Considerable interest and suggestions concerning economies of scale in regional solid waste management systems have been expressed. The economic feasibility of regional solid waste management was investigated. Primary emphasis was on the development of a model framework to facilitate analysis and selection among alternatives for regional solid waste management systems, including implications for regional economics.

STATUS

Publication Pending. EPA # 670/5-74-006

INFORMATION/CONTACT

B.H. Stevens
Regional Science Res. Inst.
G.P.O. Box 8776
Philadelphia, Penn. 19104
413-256-8526

PROJECT/TITLE

Hud-Modular Integrated Utility System Program

CITATION

N/A

ABSTRACT/SUMMARY

Description: The Modular Integrated Utility System (MIUS) is directed at providing utility service (electricity, environmental conditioning, water treatment, waste treatment and disposal) for communities of limited size, and to provide these services: 1) in an improved manner (relative to current practice) with advantages in total cost, decreased environmental impact and increased efficiency in the utilization of natural resources; 2) at a pace equal to the rate of growth of a development; and 3) to make available land for development that is not being serviced by conventional utility systems. The MIUS Program goals are to demonstrate the technology and economics of the MIUS under actual use conditions. The ORNL effort to date has consisted of conceptual design and system analyses activities. The MIUS might employ gas or oil powered engines to generate electricity for a building complex. The engine exhaust and coolant exhaust heat would supply the buildings with some of their hot water, some of their space heating, and some of their air conditioning from heat absorption-type water chillers. Water from the liquid waste treatment plant might be heated with inexpensive exhaust heat and purified to a degree acceptable for recycle as cooling water or perhaps, someday, even drinking water. Additional gas or oil, solid waste, and sludge from processing liquid waste might be burned whenever the "waste" heat from generating electricity is sized to accommodate perhaps 100 to 3000 multifamily dwelling units, nearby single-family housing, and associated commercial facilities - a common range of units for a single undertaking and simultaneous construction in a community development or redevelopment.

STATUS

The MIUS Impact Statement is now in review and negotiations with a developer for construction of a demonstration unit are in progress. Construction will begin as soon as a site has been selected and approved by HUD.

The Public Health Service has vehemently opposed the re-use of any quality wastewater. They have resisted the concept of wastewater re-use from the very beginning of the project even though the quality of processed wastewater has been at or above the acceptable standard of water quality. Publications: The Water Report HUD OR&L-HUD-MIUS-16 Liquid Waste Treatment-Collection and Disposal-MIUS #16- Review of Oakridge Treatment System, Performance and Available Sizes. Waste Water Re-use.

INFORMATION/CONTACT

A. J. Miller or William R. Mixon
Oak Ridge National Laboratory - P.O. Box X
Oak Ridge, Tenn. 37830 (615)483-6907

SOCIO-ECONOMIC AND INTERGOVERNMENTAL ASPECTS OF RESIDUAL WASTE

SECTION V

TITLE/PROJECT

Environmental New Town

CITATION

N/A

ABSTRACT/SUMMARY

The Mitre Corporation has been involved in the designing of an innovative city designed from the outset to be a model of environmental protection equipment and systems fabrication. The innovative city concepts for energy, transportation, education, communications, and waste disposal systems and in outlining site plans, city-industrial a base and infrastructure and financial implications are discussed.

STATUS

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Mitre Corporation
1820 Dolly Madison Blvd.
McLean, Va. 22101
703-790-6000

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PROJECT/TITLE

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INFORMATION/CONTACT

Bob Ewing
Battelle Memorial Research
505 King Avenue
Columbus, Ohio 43201
Montogomery County E.I.S.

J.W. Filbert
Cornell, Howland, Hayes & Merry
1930 Issac Newton Sq. Rm 202
Herrdon, Va. 22070
703-471-9710
Region 3

PROJECT/TITLE

Economic Analysis of Land-Intensive Wastewater Systems

CITATION

N/A

ABSTRACT/SUMMARY

The 1972 Water Pollution Control Act Amendments are requiring increased treatment of municipal wastewaters. One method to obtain a high quality effluent at relatively low cost compared to other techniques is land treatment.

This study compares and evaluates conventional in-plant treatment and land treatment in a cost framework and in a production efficiency framework. The major objective is to explain why more municiplaities have not chosen land treatment in the past.

STATUS

Publication available.

Publication: Water Resources Research Institute of the University of N. Carolina
UNC-WRRI-74-98 $4.00

Title: Economic Analysis of Land Treatment of Municipal Wastewaters - G. A. Carlson
Article: Water Resources Journal (Date 1975)

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Criteria for Site Selection and Operation of Sanitary Landfills

CITATION

N/A

ABSTRACT/SUMMARY

The objective of the project is to determine the authority needed to acquire land for and operate sanitary landfills; identify and evaluate powers of local governmental units and limitation of those powers to adopt and enforce land-use restrictions and regulations as they relate to sanitary landfills, and other restrictions such as environmental protection standards that affect site location; identify reasons for and extent of institutional arrangements needed for solid-waste management on an areawide basis.

State enabling legislation, administrative rules, regulations and guidelines, local ordinances, and judicial decisions applicable to site acquisition, location restrictions, landfill operations, and funding requirements were collected for most of the North Central States and analyzed. A questionaire was used in an endeavor to ascertain the reasons for and extent of opposition to location sanitary landfills in rural residential areas.

STATUS

This is an extensive project and is only half completed. Results and findings to date are discussed in the following publications.

1. North Dakota Law Review, "Solid Waste Management in North Dakota", Vol 49, #3, Spring 1973, pp. 499-535
2. Public Works, Vol 104, #3, 3/73
   Public Works, Vol 104, #4, 4/74
3. Municipal Waste-Research Needs Related to the Institutional and Legal Aspects of Recycling Municipal Waste On The Land:Research on Land & Water Resources. Proceeding: Residential Needs Related To Recycling Urban Wastewater on Land Penn. State University publication.
4. Managing Solid Waste "A Focus on Indiana Law Economics Research Service, U.S.D.A. publication

INFORMATION CONTACT

Dean T. Massey
U. of Wisconsin
U.S.D.A. Natural Resources/Economic Division
Madison, Wisconsin 53706
(608) 262-3568

PROJECT/TITLE

Lee County Solid Waste Management Project

CITATION

N/A

ABSTRACT/SUMMARY

Solid waste disposal in both the incorporated municipalities and rural areas of Lee County was unsatisfactory. The City of Tupelo made an attempt at operating a sanitary landfill in an undesirable location. With poor operation, the results were open burning, water pollution, and insect and rodent production. Disposal sites for other areas of the county were nothing more than open dumps. Garbage and rubbish collection was provided by the City of Tupelo, the towns of Nettleton and Saltillo, and by one private collection service. The citizens of the other towns hauled away their own solid wastes. Garbage storage is known to be very poor at most of the homes in the small towns. The prime objective of the project was to demonstrate the feasibility of a county-wide plan for solid waste management. A centrally-located sanitary landfill near Tupelo was operated by the county for disposal.

The solid waste management project was successful, and, as a result, most counties in Mississippi are now using a system of mobile containers.

The wells around the landfills are continously monitored. To date, there has been no evidence of leaching.

STATUS

The final report was sent to EPA in 1/74.

INFORMATION/CONTACT

Tommy Dablis
703 Crossover Road
Tupelo, Miss. 38801
601-842-7381

PROJECT/TITLE

Indiana Solid Waste Management.

CITATION

Indiana Dept. of Commerce, Indianapolis. Div. of Planning.

ABSTRACT/SUMMARY

The report is a general background paper on the social, economic and physical problems caused by solid waste. It covers solid waste management in terms of the problem of collecting, processing, treating and disposing of solid waste and the need for cooperation between the rural and urban sectors in these areas and also in the areas of administering and financing the operation. The appendix is a summary of Indiana's laws which regulate refuse and its disposal.

STATUS

$4.25/MF $0.95

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Third Pollution; the National Problem of Solid Waste Disposal. Praeger Publishers

CITATION

same as Project/Title

ABSTRACT/SUMMARY

The political aspects of solid waste disposal are discussed. The first solid waste law provided that a national research, development, and demonstration program be initiated and directed by the Department of Health, Education, and Welfare. The Bureau of Solid Wastes Management spread its funds to cover research, development, and demonstration needs among three sources of solid wastes: urban, industrial, and agricultural. The problem is that the Bureau has been given little financial support. Through the concept of revenue-sharing, the administration feels that municipalities will be able to solve their problems. However, waste disposal responsibility is often relegated to political jurisdictions too small to have sufficient resources for the job. Many communities and municipalities are beginning to realize that the regional approach to solid waste disposal is practical and economically feasible. Suggestions are made for future legislation concerning solid waste. It is recommended that the concepts of conservation and the economic balance of social progress be incorporated into future laws. (D) (G)

STATUS

This document is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

A Role for Selective Public Acquisition and Control of the Development and Utilization of Industrial Sites.

CITATION

Recent Developments in Industrial Pollution Control; Proceedings of the Fourth Annual Northeastern Regional Antipollution Conference, University of Rhode Island, July 13-15 1971 Technomic Publishing Co.

ABSTRACT/SUMMARY

In choosing a site for a power plant, oil refinery, or other industrial complex, environmental factors should surely be considered. However, the term 'environmental factors' is too frequently construed to mean only the industry's impact in water, air, and land pollution. If we are to avoid all environmental damage by industry, then we shall have to outlaw industry. The American public has not yet expressed a willingness to lower its standard of living to curb the stress placed on the ecology by industry. Therefore, since no plant can be located where its will do absolutely no damage to the environment, other, broader factors must be considered as well. The impact of the new industry on the socioeconomic life of the area, such as its ability to provide jobs in areas with high unemployment, should also be judged as part of its environmental impact. A new industry may help, if intelligently located, to stem the rural-urban migration, thereby keeping the population distribution more balanced. These are decisions that must be made, not by the industry involved, but by the planning arm of the electorate. To this end, industrial parks should be bought in advance of need and their tenants of lessees chosen as a matter of public policy.

STATUS

This document is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Sludge Processing, Transportation, and Disposal/Resource Recovery; Planning Perspective

CITATION

N/A

ABSTRACT/SUMMARY

A methodology was developed in this report for use in the 208 planning process for the evaluation of alternatives for the ultimate disposal of residual wastes generated in municipal wastewater treatment plants. This methodology considered technical, economic, social, and institutional factors pertinent to a thorough review of alternatives.

Residual wastes generated in municipal wastewater treatment plants were characterized. Handling and treatment processes for the residual wastes were discussed and evaluated in light of qualitative and quantitative changes to the residual wastes. Liquid, gaseous, and solid sidestreams produced in residual waste treatment were evaluated and rail, pipeline, barge, and truck transport of residual wastes were analyzed.

Environmental, operational, and institutional constraints to the use of ocean disposal, lagoons, sanitary landfills, sludge recycling, and land reclamation were presented.

STATUS

Completed in Feb. 1975 - EPA Publication - Contract # 68-01-3104
Publication Pending

INFORMATION CONTACT

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Water Planning Division/Planning Assistance
401 M St. S.W.
Wash. D.C. 20460
(202) 426-2474

PROJECT/TITLE

Attitudes of Illinois Citizens Toward Solid Waste and the Environment

CITATION

Sigler, Jeanne; Illinois Inst. for Environmental Quality, Chicago, Illinois University, Urbana Jun 73; 140p

ABSTRACT/SUMMARY

A survey of citizens throughout Illinois was made to determine their attitudes toward the problem of solid waste. In general, city size or regional differences were noted as the most important predictors of respondent attitudes toward the environment. Residents of large cities (>100,000) expressed more concern for the collection, processing, and disposal of their trash and garbage than others. Next to residents of large cities, those living in the open country had the most serious solid waste probelms, due either to the difficulty of disposal of crop and animal wastes, or to the lack of adequate collection services.

STATUS

N/A

INFORMATION/CONTACT

Available from NTIS;pc 9.00/m $1.45
pb-223 457/3

RESIDUAL WASTE MODELS

Section VI

TITLE/PROJECT

Environmental New Town

CITATION

N/A

ABSTRACT/SUMMARY

The Mitre Corporation has been involved in the designing of an innovative city designed from the outset to be a model of environmental protection equipment and systems fabrication. The innovative city concepts for energy, transportation, education, communications, and waste disposal systems and in outlining site plans, city-industrial a base and infrastructure and financial implications are discussed.

STATUS

There has been several briefing sessions with HUD and other federal agencies. The project, Environmental New Town, was a joint research effort.

Information and preliminary reports are available upon request from:

INFORMATION/CONTACT

R. Rifkin
Mitre Corporation
1820 Dolly Madison Blvd.
McLean, Va. 22101
703-790-6000

PROJECT/TITLE

Automated System for Water Pollution Control from an Animal Production Unit

CITATION

N/A

ABSTRACT/SUMMARY

The specific aims of the project were: 1. To continue to monitor with weekly sampling and laboratory analyses the overall performance characteristics of the plant. 2. To install, test and evaluate the performance of the aerobic digester equipment to be provided by DeLaval Comapny, or if not by them, to purchase and build a surface aerator for installation in the aerobic digester. 3. Surface aerator; submergence and speed variation in rotor; turbidity improvement of the effluent with the use of coagulants; evaluation of chlorine disinfection of the recycled effluent. 4. To automate the disposal of solids onto the nearby farm land with the use of automatically operated irrigation system. 5. To establish some monitoring stations for sampling and analyzing the water from the Loramie Creek that receives the drainage from the research farm of the Botkins Grain and Feed Company. 6. Develop an economic model of the plant to evaluate ways of making the system economically feasible.

STATUS

Completed.

The project was monitored for 3 yrs., and is reputedly the longest study of a project of this type. The report is well documented. The findings were presented in April, 1975 at a conference.

The report has been cleared for publication and is awaiting printing by EPA.

INFORMATION/CONTACT

Dr. EP Taiganides
Agricultural Engineering
614-422-6626
Ohio State University
School of Agriculture

190 N. Oval Dr., 102 Administration Bldg.
Columbus, Ohio 43210

PROJECT/TITLE

A Predictive Model for the Configuration of and Concentration Variations within Malenclaves Resulting from Refuse Landfills

CITATION

N/A

ABSTRACT/SUMMARY

The objective is to further develop and test a predictive model relating the contamination variations within a malenclave to the water-table gradient, permeability, distance from source, depth, age of landfill and precipitation. Approach is to predict the contamination qualities for various landfills from the model and compare predicted to actual conditions. Test sites will be both previously studied landfills and new sites. At the new sites groundwater quality will be sampled from well nests containing boreholes to 15, 25, and 40 feet and analyzed by usual chemical techniques.

STATUS

Ongoing project. Investigators are attempting to modify the computer model (designed by Freeze, IBM) for use by countries, cities, etc. in planning disposal programs.

INFORMATION/CONTACT

L. V. Sendlein 294-8252
R. C. Palmquist 204-7814
Iowa State University
Water Resources Research Inst.
403 Town Engineering Bldg.
Ames, Iowa 50010

PROJECT/TITLE

Thermophilic Aerobic Digestion of Organic Solid Wastes
(Andrews, John F., Kambhu, Kawi)

CITATION

N/A

ABSTRACT/SUMMARY

The major reactions involved in the process of thermophilic aerobic digestion are presented, discussed, and simplified into the basic stoichimetric, thermochemical, kinetic relationships. A simple procedure is presented for determining the thermochemistry of the net reaction by relating heat production to the oxygen equivalent or C.O.D. of the organic solids.

The simulation studies and mathematical model discussed employ conservative values of biological parameters. The mathematical model provides assistance in planning and conducting pilot plant studies.

STATUS

Final Report. - NTIS $6.25/MF $1.45
PB 222 396

INFORMATION CONTACT

Clemson University
S. C. Dept. of Environmental System Engineering

PROJECT/TITLE

Cost-Effectiveness Study for Handling and Disposal of Organic Sludges

CITATION

N/A

ABSTRACT/SUMMARY

The goal of this project is to develop mathematical model for all commonly used processes for sludge handling and disposal and to use these models in an Executive program which will size all processes and estimate the cost of the complete treatment train. Processes being considered are gravity thickening, air flotation thickening, centrifugation, anaerobic digestion, elutriation, aerobic digestion, vacuum filters, sand drying beds, multiple hearth incineration, and transport and disposal to land. A total of 181 ways have been identified to handle and dispose of both primary and waste activated sludge. Computation of the cost of these alternative processes will begin when models for aerobic digestion and land disposal have been completed.

STATUS

Final stage of Preparation for Publication

INFORMATION CONTACT

Richard Eilers or Robert Smith
NERC
5555 Ridge Ave.
Cinn., Ohio 45213
684-2200, 8352

PROJECT/TITLE

Water-Quality of Selected Solid-Waste Disposal Sites, Suffolk County, Long Island, New York

CITATION

Preliminary Findings of a Leachate Study on Two Landfills in Suffolk County, New York. By Grant E. Kimmel and Olin C. Braids. Journal of Research, U.S. Geological Survey, Vol.3 , No. 3, May-June 1975, p. 273-280

ABSTRACT/SUMMARY

In anticipation of the expected population growth in the county, water planning and management agencies feel the need for regulation in the operation of solid-waste-disposal sites and in the selection of new sites, so as to prevent unreasonable or unnecessary deterioration of the quality of the ground water or of the environment. In drafting regulations, information is needed with regard to the character of the leachate and chemical reactions that may occur in the zones of aeration and saturation. In this respect information was needed on incinerated solid waste as well as the general variety of solid wastes.

The major objectives of this project were to (a) document the nature and extent of changes in the chemical quality of the ground water associated with solid-waste disposal at one or more selected sites, and (b) apply existing modeling techniques to predict the nature and rate of change (both as a function of time and space) of the chemical quality of the ground water. To the extent possible, modeling efforts involved the zone of aeration and the zone of saturation.

STATUS

N/A

INFORMATION CONTACT

Dale Mosher - EPA/SWM
1835 K Street, N.W. AW/564
Washington, D.C.

PROJECT/TITLE

Regional Management of Animal Manures

CITATION

Dodd, V.A., D.F. Lyons, and J. R. O'Callaghan.

ABSTRACT/SUMMARY

It is proposed that a centralized storage facility should be provided for a group of pig and/or poultry units. The manure that is collected and brought to the central store can be disposed of by spreading on land in a separate operation. A mathematical, analytical model is constructed to determine the best place to locate the central store, and spead the manure. The model was applied to a specific region containing 58 pig fattening units. Results showed that the system may be economically attractive, having as additional advantages the minimization of pollutional hazards and the relieving of the pig or poultry farmer of the task of manure management.

STATUS

SWIRS Library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Optimization Models for Regional Public Systems.

CITATION

Vasan, K.S., Berkeley, University of California, Operations Research Center, Feb. 1974. 128 p.

ABSTRACT/SUMMARY

Optimization models for regional solid waste management systems are presented and discussed. A review of papers and reports on the application of systems analysis and operations research to the problems of solid waste management is presented. The development of optimization models for regional solid waste management systems is discussed. The mathematical formulation of the problem is included and methods of solving static models are described. The algorithms used in the solutions are discussed. Sample problems for each of three static models are solved. Data and functions used in these solutions are included. A mathematical formulation of the long range planning of locations and expansion of facilities for regional management of solid waste systems is presented and the procedure for its solution is demonstrated.

STATUS

This document is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Stochastic Population Dynamics for Regional Water Supply and Waste Management Decision-making.

CITATION

Ph. D. Thesis, University of Massachusetts, Amherst, Mass., 1970

ABSTRACT/SUMMARY

A rational methodology for local area population projection and water and sewer service area prediction is developed. The projection model consists of a stochastic simulation of inter-regional population growth and a finite difference solution to a non-linear partial differential equation describing spatial variations in urban population densities. The projection model output is designed as input to optimization algorithms for regional water supply and waste treatment facilities. The components of demographic change are modeled as regressive stochastic processes, and response surface algorithm is developed to decompose net migration rates into in-and-out migration rates. Service area prediction is based on a computerized evaluation of the distance-density relations at the existing service area periphery. Comparison of results to preliminary census figures for 1970 indicates a superior prediction performance over traditional methods of population projection as practiced by consulting engineers and planners. (T)

STATUS

This thesis available from University Microfilms, order no 71-6390.

INFORMATION/CONTACT

U. of Massachusetts, Amherst, Mass.

PROJECT/TITLE

Regional Planning Models for Solid Waste Management.

CITATION

Kuhner, J., and B. Heilet; static LP-model. In Models for environmental pollution control. Ann Arbor, Michigan, Ann Arbor Science Publishers, Inc., 1973. p.344-347.

ABSTRACT/SUMMARY

The static average distance Lp-model can be used for today's usual regional transportation and processing problems. It is further generalized to include more of today's recognized processing and disposal alternatives. Engineers and planners should be able to extend the models to include all the alternatives available in regional solid waste management. These models can also be extended to include more constraints. The static LP-model can also be extended and serve as an introduction to fixed charge problems and mixed integer programming. A problem arises when regionalization is contemplated to take over the existing facilities of many independent operations. Some of the existing activities may need to be phased out as economically infeasible, and associated with the phasing out will be costs such as dismantling an incinerator or recultivating over a dump. Considerations of the problems concerning regional solid waste management showed that extensions to the simpler static average location model would be strongly desirable. Unfortunately, many of the desired extensions cannot be solved by an LP but would also require solution by mixed integer programming.

STATUS

This document is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

A Pollution-Free System for the Economic Utilization of Municipal Solid Waste - Phase II

CITATION

N/A

ABSTRACT/SUMMARY

This is the final phase of a project in which the most cost-effective pollution free system for the conversion of solid waste generated in New York City to a source of energy and recyclable materials will be designed. The manual will be especially addressed to nontechnical municipal authorities and decision-makers faced with the problem of choosing among the many competing advanced technology options in Solid Waste Management.

A complete system has been designed for Westchester County to test the generalizability of the results to a lower density suburban community having no resident electric utility. The manual summarizes the quantitative and qualitative findings of the project in well digested, generic terms to facilitiate their dissemination to other American municipalities of varying sizes. The manual is a compendium of four position papers.

STATUS

The manual is near completion. Publication is expected in August, 1975. The title is Resource Recovery Handbook for Public Officials.

INFORMATION/CONTACT

Helmut W. Schulz
School of Engineering
378 Engineering Terrace
New York, New York 10027
212-280-2374

PROJECT/TITLE

Projection and Analyses of the Economies of Substate Planning Districts in Oklahoma

CITATION

N/A

ABSTRACT/SUMMARY

The present study attempts to construct a data base for substate planning. The emphasis is on estimating an analytical model of the economic base for each of the planning districts in Oklahoma. Analysis of the economic base is for purposes of projecting employment and income levels and for estimating the impact of changes in the planning district economies.

The study is structured primarily for use by regional planners in Oklahoma. Regional Planners should find it useful for purposes of community services planning, public capital budgeting, or for other areas of community development planning. Most technical detail has been relegated to appendices. The study, however, should also be found useful to research scientists investigating spatial requirements for transportation, energy, water, or other critical resources.

STATUS

Publication available upon request.

INFORMATION/CONTACT

Dr. D. F. Schreiner
Oklahoma State University
Department of Agricultural Economics
Stillwater, Oklahoma 74075
405-372-7511

PROJECT/TITLE

Models for Environmental Pollution Control.

CITATION

Ann Arbor, Michigan, Ann Arbor Science Publishers, Inc., 1973. 448 p.

ABSTRACT/SUMMARY

Mathematical models and systems analysis techniques for the control of environmental pollution and resources development are discussed. The studies included combine mathematical modeling, systems analysis, and computer techniques with environmental pollution control technology. The volume is addressed to the scientists and engineers who are involved in the control of environmental pollution. The role of systems analysis and mathematical modeling in the areas of water pollution control, water supply and water resources development, air pollution control, solid waste disposal, noise control, and total environment systems is discussed. Solid waste management models and regional waste disposal planning models are presented. The use of mathematical modeling in designing refuse collection systems and routing patterns for street cleaning and snow removal operations is explained.

STATUS

This document is retained in the SWIRS library.

INFORMATION

N/A

PROJECT/TITLE

Total Environmental Quality Management Models.

CITATION

In Models for environmental pollution control. Ann Arbor, Michigan, Ann Arbor Science Publishers, Inc., 1973. p. 403-436

ABSTRACT/SUMMARY

Traditionally, gaseous, liquid, and solid waste management problems have been dealt with separately with little or no concern for the other environmental media, such as atmosphere, water courses, and land, into which residuals are discharged. The purpose of this study is to delineate the entire regional residuals management system, including the range of management options available to society for improving environmental quality, and to indicate how all the components of the system may be expressed and ultimately linked together within the same computational framework. A regional residuals management model that includes all the relevant management options available to society for improving environmental quality consists of residuals generation and discharge models, environmental modification models, environmental quality models, damage functions, and management strategies. The management model is formulated quantitatively and mathematical forms of the various environemntal models are discussed. An atmospheric dispersion model and an aquatic ecosystem model are included. Computational schemes for selecting an optimal management strategy are suggested.

STATUS

This document is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

The Planning Process

CITATION
Solid Waste Management Plan
Olympia, Washington, Department of Ecology, State of Washington, 1.4.72

ABSTRACT/SUMMARY

A model for the procedural process in developing a local solid waste management plan is provided. It must be remembered that planning is not as static a process as a model would suggest; it is dynamic and continuous. At many points in a planning process feedback into the system occurs, which may influence the plan and make changes necessary. Outside events may also affect the suitability of the plan. The first step in any planning process is awareness of the existence of a problem. This realization leads to data collection which may determine further aspects of the difficulty. Once the problem is fully identified, objectives can be formulated. Several alternatives may be available to achieve the objectives set forth. Identifying alternatives and deciding among them requires the continuing assistance of a interdisciplinary technical advisory staff. These experts may rule out some alternatives as impractical or economically prohibitive, while they may propose other solutions that had not occurred to the planning agency. Existing plans, such as State, regional or local plans, should be taken into consideration. Public information must be dealt with at every phase of the planning process. Only by informing the public of what problems are being attacked and what solutions considered can the planners be assured of maximum public support for the final planning phase, the establishment of the plan.

STATUS

N/A

INFORMATION/CONTACT

N/A

RESIDUAL WASTE PLANNING & MANAGEMENT

Section VII

Part I   State & Local Planning/Management

Part II   Regional Planning

Part III Other

PROJECT/TITLE

The Planning Process

CITATION
Solid Waste Management Plan
Olympia, Washington, Department of Ecology, State of Washington, 1.4.72

ABSTRACT/SUMMARY

A model for the procedural process in developing a local solid waste management plan is provided. It must be remembered that planning is not as static a process as a model would suggest; it is dynamic and continuous. At many points in a planning process feedback into the system occurs, which may influence the plan and make changes necessary. Outside events may also affect the suitability of the plan. The first step in any planning process is awareness of the existence of a problem. This realization leads to data collection which may determine further aspects of the difficulty. Once the problem is fully identified, objectives can be formulated. Several alternatives may be available to achieve the objectives set forth. Identifying alternatives and deciding among them requires the continuing assistance of a interdisciplinary technical advisory staff. These experts may rule out some alternatives as impractical or economically prohibitive, while they may propose other solutions that had not occurred to the planning agency. Existing plans, such as State, regional or local plans, should be taken into consideration. Public information must be dealt with at every phase of the planning process. Only by informing the public of what problems are being attacked and what solutions considered can the planners be assured of maximum public support for the final planning phase, the establishment of the plan.

STATUS

N/A

INFORMATION/CONTACT

N/A

Pages 290, 291 and 292 are blank.

PROJECT/TITLE

Projection and Analyses of the Economies of Substate Planning Districts in Oklahoma

CITATION

N/A

ABSTRACT/SUMMARY

The present study attempts to construct a data base for substate planning. The emphasis is on estimating an analytical model of the economic base for each of the planning districts in Oklahoma. Analysis of the economic base is for purposes of projecting employment and income levels and for estimating the impact of changes in the planning district economies.

The study is structured primarily for use by regional planners in Oklahoma. Regional Planners should find it useful for purposes of community services planning, public capital budgeting, or for other areas of community development planning. Most technical detail has been relegated to appendices. The study, however, should also be found useful to research scientists investigating spatial requirements for transportation, energy, water, or other critical resources.

STATUS

Publication available upon request.

INFORMATION/CONTACT

Dr. D. F. Schreiner
Oklahoma State University
Department of Agricultural Economics
Stillwater, Oklahoma 74075
405-372-7511

PROJECT/TITLE

Sanitary Landfill Technology

CITATION

Weiss, S. Los Angeles County study. In Sanitary landfill technology. Park Ridge, New Jersey, Moyes Data Corporation, 1974. p.252-269

ABSTRACT/SUMMARY

A study conducted by the County of Los Angeles, California, to formulate construction criteria for sanitary landfills and improvements which would lead to optimum land development and use is reported. Methods utilized in the study are described. Monitoring and prediting subsidence and compaction of landfill, gas movement and control, and groundwater pollution from sanitary landfills are discussed. Criteria for the location, design, construction, inspection, supervision, and maintenance of sanitary landfills; for the uses of land on or adjacent to sanitary landfills; and for the development, construction, and maintenance of improvements to sanitary landfills established as a result of this study are discussed.

STATUS

SWIRS library

INFORMATION CONTACT

N/A

PROJECT/TITLE

Water-Quality of Selected Solid-Waste Disposal Sites, Suffolk County, Long Island, New York

CITATION

Preliminary Findings of a Leachate Study on Two Landfills in Suffolk County, New York. By Grant E. Kimmel and Olin C. Braids. Journal of Research, U.S. Geological Survey, Vol.3 , No. 3, May-June 1975, p. 273-280

ABSTRACT/SUMMARY

In anticipation of the expected population growth in the county, water planning and management agencies feel the need for regulation in the operation of solid-waste-disposal sites and in the selection of new sites, so as to prevent unreasonable or unnecessary deterioration of the quality of the ground water or of the environment. In drafting regulations, information is needed with regard to the character of the leachate and chemical reactions that may occur in the zones of aeration and saturation. In this respect information was needed on incinerated solid waste as well as the general variety of solid wastes.

The major objectives of this project were to (a) document the nature and extent of changes in the chemical quality of the ground water associated with solid-waste disposal at one or more selected sites, and (b) apply existing modeling techniques to predict the nature and rate of change (both as a function of time and space) of the chemical quality of the ground water. To the extent possible, modeling efforts involved the zone of aeration and the zone of saturation.

STATUS

N/A

INFORMATION CONTACT

Dale Mosher - EPA/SWM
1835 K Street, N.W. AW/564
Washington, D.C.

PROJECT/TITLE

Criteria for Site Selection and Operation of Sanitary Landfills

CITATION

N/A

ABSTRACT/SUMMARY

The objective of the project is to determine the authority needed to acquire land for and operate sanitary landfills; identify and evaluate powers of local governmental units and limitation of those powers to adopt and enforce land-use restrictions and regulations as they relate to sanitary landfills, and other restrictions such as environmental protection standards that affect site location; identify reasons for and extent of institutional arrangements needed for solid-waste management on an areawide basis.

State enabling legislation, administrative rules, regulations and guidelines, local ordinances, and judicial decisions applicable to site acquisition, location restrictions, landfill operations, and funding requirements were collected for most of the North Central States and analyzed. A questionaire was used in an endeavor to ascertain the reasons for and extent of opposition to location sanitary landfills in rural residential areas.

STATUS

This is an extensive project and is only half completed. Results and findings to date are discussed in the following publications.

1. North Dakota Law Review, "Solid Waste Management in North Dakota", Vol 49, #3, Spring 1973, pp. 499-535
2. Public Works, Vol 104, #3, 3/73
   Public Works, Vol 104, #4, 4/74
3. Municipal Waste-Research Needs Related to the Institutional and Legal Aspects of Recycling Municipal Waste On The Land:Research on Land & Water Resources. Proceeding: Residential Needs Related To Recycling Urban Wastewater on Land. Penn. State University publication.
4. Managing Solid Waste "A Focus on Indiana Law Economics Research Service, U.S.D.A. publication

INFORMATION CONTACT

Dean T. Massey
U. of Wisconsin
U.S.D.A. Natural Resources/Economic Division
Madison, Wisconsin 53706
(608) 262-3568

PROJECT/TITLE

Economic Analysis of Land-Intensive Wastewater Systems

CITATION

N/A

ABSTRACT/SUMMARY

The 1972 Water Pollution Control Act Amendments are requiring increased treatment of municipal wastewaters. One method to obtain a high quality effluent at relatively low cost compared to other techniques is land treatment.

This study compares and evaluates conventional in-plant treatment and land treatment in a cost framework and in a production efficiency framework. The major objective is to explain why more municiplaities have not chosen land treatment in the past.

STATUS

Publication available.

Publication: Water Resources Research Institute of the University of N.
Carolina
UNC-WRRI-74-98 $4.00

Title: Economic Analysis of Land Treatment of Municipal
Wastewaters - G. A. Carlson
Article: Water Resources Journal (Date 1975)

INFORMATION/CONTACT

N/A

TITLE/PROJECT

Environmental New Town

CITATION

N/A

ABSTRACT/SUMMARY

The Mitre Corporation has been involved in the designing of an innovative city designed from the outset to be a model of environmental protection equipment and systems fabrication. The innovative city concepts for energy, transportation, education, communications, and waste disposal systems and in outlining site plans, city-industrial a base and infrastructure and financial implications are discussed.

STATUS

There has been several briefing sessions with HUD and other federal agencies. The project, Environmental New Town, was a joint research effort.

Information and preliminary reports are available upon request from:

INFORMATION/CONTACT

R. Rifkin
Mitre Corporation
1820 Dolly Madison Blvd.
McLean, Va. 22101
703-790-6000

PROJECT/TITLE

Contingency Planning for Resource Recovery

CITATION

N/A

ABSTRACT/SUMMARY

A resource recovery plant has been designed by the National Center for Resource Recovery, and is presently under construction in New Orleans, La. The plant will be operated by a private firm.

The plant is scheduled to open on May 1, 1976, with a 650 ton per day material recovery system that utilizes shredding, classifying and extraction of aluminum, glass, iron, steel, and non-ferrous metals (excluding aluminum) and paper. The residuals, which will be mostly organic, will be landfilled.

The waste system was so designed as to have no adverse environmental impact upon ground or surface water. Water sampling is being done around the site to establish hydrogeological data, and sampling will continue during the course of operation.

The plant is being built on city-owned land. The cost of the plant, with the exception of the recovery system, is borne by the private firm. The resource recovery system is financed by the National Center For Resource Recovery, a non-profit research organization.

The plant will process one-half of the city's waste initially. Two incinerators will be de-commissioned upon completion of the plant.

Some of the profit gained from the sale of recovered materials will be shared by the city of New Orleans.

STATUS

N/A

INFORMATION/CONTACT

J. F. Bernheisel
National Center for Resource Recovery
1211 Connecticut Ave., N.W.
Washington, D.C. 20036
202 223-6154

PROJECT/TITLE

Guidelines for Local Governments on Solid Waste Management

CITATION

National Association of Counties Research Foundation, Washington, D.C.

ABSTRACT/SUMMARY

Ten guides have been prepared on solid waste management to assist local elected and appointed policy making officials. These guides cover the following topics; Areawide approaches; Legal authority: Planning; Organization; Design and operation; Financing; Technical and financial assistance; Citizen support; Personnel; and an Acticn plan and Bibliography.

STATUS

GPO/MF $0.95-NTIS - PB-214 039/0

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Organization

CITATION

Guidelines for Local Governments on Solid Waste Management. Public Health Service Publication No. 2084.

ABSTRACT/SUMMARY

The major functions of a comprehensive solid waste management system are: policymaking; public information; budgeting, planning and review; drafting, adoption and enforcement of standards; and operation of the system. The public should have access to information concerning the activities and policies of the solid waste management system. Local governments must concern themselves with operation of systems for both collection and disposal. (D) (G)

STATUS

This document is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Maryland Creates a Statewide Wholesale Sanitary District to Save Her Waterways.

CITATION

N/A

ABSTRACT/SUMMARY

Maryland has enacted a statewide program to coordinate wastewater and solid waste disposal. The Maryland Environmental Service (MES) will: accept waste from municipalities and corporations, under contract; designate or create regional facilities for receiving and treating them; dispose of the wastes in the purest, most economical and most efficient way; and encourage reduction in the amount of waste generated and discharged to the environment. MES will charge fees for its waste-acceptance service and seek to become self-supporting in six years. MES can issue its own revenue bonds to finance new or improved facilities that hard-squeezed communities have had to pay for on their own. An important aim of MES is to disseminate the technical expertness as well as the financial assistance emanating from Washington, D.C. MES can engage in research and developmental studies and investigations into improved methods and techniques of liquid and solid wastes acquisition, processing, purification, disposal, and management. MES cannot supplant any municipal wastewater purification solid-waste-disposal project that is giving adequate service. The entire state will be divided into service regions. Subsequent to regionalization will be the adoption of a 5-year plan--subject to biennial review--for every service region. To avoid building up overhead, MES expects to use personnel interregionally instead of confining them to a single region. In its statewide focus, and its aim of enhancing the provision of service, MES is comparable to water authorities in Ohio and New York. As a statewide wholesale sanitary district, however, MES breaks new ground.

STATUS

Retained in the SWIRS Library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Regional Planning Models for Solid Waste Management.

CITATION

Kuhner, J., and B. Heilet; static LP-model. In Models for environmental pollution control. Ann Arbor, Michigan, Ann Arbor Science Publishers, Inc., 1973. p.344-347.

ABSTRACT/SUMMARY

The static average distance Lp-model can be used for today's usual regional transportation and processing problems. It is further generalized to include more of today's recognized processing and disposal alternatives. Engineers and planners should be able to extend the models to include all the alternatives available in regional solid waste management. These models can also be extended to include more constraints. The static LP-model can also be extended and serve as an introduction to fixed charge problems and mixed integer programming. A problem arises when regionalization is contemplated to take over the existing facilities of many independent operations. Some of the existing activities may need to be phased out as economically infeasible, and associated with the phasing out will be costs such as dismantling an incinerator or recultivating over a dump. Considerations of the problems concerning regional solid waste management showed that extensions to the simpler static average location model would be strongly desirable. Unfortunately, many of the desired extensions cannot be solved by an LP but would also require solution by mixed integer programming.

STATUS

This document is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

Pages 304, 305 and 306 are blank.

PROJECT/TITLE

Transport, Scale and Design Options: Design Methods in the Evaluation of Policy Related Research in the Field of Municipal Solid Waste.

CITATION

Hudson, J. F., F. P. Gross, D. G. Wilson, and D. H. Marks. In Evaluation of policy-related research in the field of municipal solid waste management. Cambridge, Massachusetts Institute of Technology, Civil Engineering Systems Laboratory, Sept. 1974. p. 145-160.

ABSTRACT/SUMMARY

This evaluation of the research on local solid waste management problems was funded by the National Science Foundation and is primarily concerned with residential wastes. While no procedure has been developed which can find the least cost system considering all possible alternatives and all factors which affect cost, several methods exist for finding the best alternative large scale solid waste management system given certain assumptions about the alternatives considered and the cost structure involved in the system. There has, however, been little documented field application of methods. Techniques have been developed which attempt to select the least cost alternatives where only monetary costs are considered. Methods for including social and political objectives offer a potentially valuable aid in facility location, but are still in an early stage of development. Some work has been done which attempts to combine a least cost analysis with input on political and social objectives directly from the decision maker. These methods terd to require an excessive time commitment from the decision maker with little change of worthwile output other than possibly allowing the decision maker to view tradeoffs between objectives more clearly. Little effort has been made in including capacity expansion considerations for facilities in the location models. Very useful work is, however, available for considering optimal strategies for capacity expansion for facilities with given service areas and growth rates. If regional programs become more popular, these models will have a chance at field verification and further development.

STATUS

N.A

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Developing Local and Regional Solid Waste Management Plan; a Division of Technical Operations Open-file Report (TO 14.0)

CITATION

Toftner, R.O., Developing Local and Regional Solid Waste Management Plan; a Division of Technical Operations Open-file Report (TO 14.0); Cincinnati, Ohio, U.S. Environmental Protection Agency; 1971

ABSTRACT/SUMMARY

This document describes the basic features of the planning process and their utilization in the development of a local or regional plan for solid waste management. The purpose of the booklet is to aid local and regional agencies in preparing comprehensive solid waste management plans. The first part of the document reviews the planning process itself. The essential base studies are listed and discussed. Part III is devoted to management considerations to be included in the planning operation, and management techniques are discussed. Sections are also given over to implementation of the plan and report preparation. A sample format for reporting the plan is provided, as well as a short bibliography. (C)(G)

STATUS

N/A

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Planning for Solid Waste Disposal: America's Biggest Industry.

CITATION

N/A

ABSTRACT/SUMMARY

This publication discusses the following: planning for solid waste disposal; America's biggest industry: the production of waste; workshops on planning for solid waste management; data for solid waste planning; workshops on data for solid waste planning; intergovernmental cooperation and public involvement in solid waste management; workshops on intergovernmental cooperation and public involvement; solid waste legislation; workshops on solid waste legislation; implementation of solid waste management plans; workshops on implementation of solid waste management.

STATUS

Paper copy available from GPO $0.45 as stock no. 5502-3307, Ep32:P69. Library of Congress catalog card no. 71-611731. E7301

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Intergovernmental Aspects of Environmental Control: Intergovernmental Cooperation--the Use of Interstate Compacts.

CITATION

Grad, F. P., G. W. Rathjens, and A. J. Rosenthal. In Environmental control: priorities,policies, and the law. New York, Columbia University Press, 1971. p. 130-146.

ABSTRACT/SUMMARY

There has been relatively little intergovernmental cooperation in the area of environmental regulation or enforcement. What intergovernmental cooperation there has been has involved cooperation imposed from the top down, rather than among governments at the same level. This type of relationship is seen in such areas as grant-in-aid programs and atomic energy control. Perhaps the only device for intergovernmental cooperation which has had some experience is the interstate compact. A number of interstate compacts have evolved for the regulation of water pollution. The development of the compact device in the field of air pollution has been much less advanced than in water pollution contorl, and no air pollution control compacts are presently in effect. The interstate compact device, in spite of the many criticisms that have been leveled against it, is the only workable device for regional pollution control management short of general federal controls. Efforts should be directed to devising interstate compact mechanisms that will meet the criticisms and that will enable interstate compact agencies to function free from the obstacles that the configuration of particular compacts has frequently imposed on such agencies in the past. The role of the Federal Government in encouraging such pacts and in participation in them is discussed.

STATUS

This doucument is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Managing the Natural Environment; a Regional Plan for Water, Sewage, Air and Refuse

CITATION

N/A

ABSTRACT/SUMMARY

The Tri-State Transportation Commission, representing the States of Connecticut, New Jersey and New York, presents a report dealing with air and water pollution and with the problems of solid waste disposal. It is recommended that State leadership establish a regional pattern of solid waste disposal. The main aims are concerned with the protection of public health in all disposal practices and with protection of the environment against damage. Reuse of materials to reduce the solid waste problem is to be encouraged. New low-cost solutions for solid waste disposal problems will be sought. The disposal of waste by means of sanitary landfills is the least expensive method, but sites are not easily available, and exporting refuse to other areas appears next most economical. However, transoprt cost and social resistance to waste 'imports' are sure to raise further difficulties. It was therefore decided that the best solution would be to develop a regional waste disposal plan that depends on presently used techniques. Landfill sites will not be available for refuse in the metropolitan area; this refuse will therefore have to be incinerated. Collection, cost and organization of this plan are described. (D)(G)

STATUS

NTIS PS 190-290

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Regional Government and Conservation.

CITATION

Volume 26 Journal of Soil and Water Conservation; Beecroft, Eric Mar-Apr.1971

ABSTRACT/SUMMARY

In bringing professionals and politicians together, regional government takes on a great significance. Knowledge must be assembled and applied to economic development and community building. A strong case is often made for special purpose agencies, to handle each facet of municipal government, rather than having a centralized agency do it all. In Ontario, water, as a resource, is split among several agencies, and many measures have been deferred because of jurisdictional conflicts. The authority was not convinced that any broad, long-range project would receive financial assistance from the province. Municipal representatives were not appointed for their ability to form a link between the authority and the grassroots. The Wheatly Commission in Scotland came out for local governments to take over water supply, sewerage, river purification, and flood prevention agencies. The Canadian Federation of Mayors and Municipalities also urged the creation of strong, multipurpose regional governments rather than special agencies. Community finance corporations can be set up for conservation, flood protection, pollution control, and water supply. Provinces and local authorities could be given broader taxing powers. In giving power to regional governments, citizen participation will be increased. (D) (G)

STATUS

SWIRS Library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Total Environmental Quality Management Models.

CITATION

In Models for environmental pollution control. Ann Arbor, Michigan, Ann Arbor Science Publishers, Inc., 1973. p. 403-436

ABSTRACT/SUMMARY

Traditionally, gaseous, liquid, and solid waste management problems have been dealt with separately with little or no concern for the other environmental media, such as atmosphere, water courses, and land, into which residuals are discharged. The purpose of this study is to delineate the entire regional residuals management system, including the range of management options available to society for improving environmental quality, and to indicate how all the components of the system may be expressed and ultimately linked together within the same computational framework. A regional residuals management model that includes all the relevant management options available to society for improving environmental quality consists of residuals generation and discharge models, environmental modification models, environmental quality models, damage functions, and management strategies. The management model is formulated quantitatively and mathematical forms of the various environemntal models are discussed. An atmospheric dispersion model and an aquatic ecosystem model are included. Computational schemes for selecting an optimal management strategy are suggested.

STATUS

This document is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

The Planning Process

CITATION

Solid Waste Management Plan
Olympia, Washington, Department of Ecology, State of Washington, 1.4.72

ABSTRACT/SUMMARY

A model for the procedural process in developing a local solid waste management plan is provided. It must be remembered that planning is not as static a process as a model would suggest; it is dynamic and continuous. At many points in a planning process feedback into the system occurs, which may influence the plan and make changes necessary. Outside events may also affect the suitability of the plan. The first step in any planning process is awareness of the existence of a problem. This realization leads to data collection which may determine further aspects of the difficulty. Once the problem is fully identified, objectives can be formulated. Several alternatives may be available to achieve the objectives set forth. Identifying alternatives and deciding among them requires the continuing assistance of a interdisciplinary technical advisory staff. These experts may rule out some alternatives as impractical or economically prohibitive, while they may propose other solutions that had not occurred to the planning agency. Existing plans, such as State, regional or local plans, should be taken into consideration. Public information must be dealt with at every phase of the planning process. Only by informing the public of what problems are being attacked and what solutions considered can the planners be assured of maximum public support for the final planning phase, the establishment of the plan.

STATUS

N/A

INFORMATION/CONTACT

N/A

PROJECT/TITLE

The Planning Process.

CITATION

Developing a Local and Regional Solid Waste Management Plan; a Division of Technical Operations Open-file Report (TO 14.0); Cincinnati, Ohio, U.S. Environmental Protection Agency; Toftner, R.O. 1971

ABSTRACT/SUMMARY

The planning process is a systematic method of recognizing that a general situation or problem exists; collecting and analyzing data about the problem; redefining the situation or problem in light of analyzed data; establishing objectives to change the situation; predetermining the methods, timing, and priorities for achieving objectives; and evaluating the predetermined methods in light of their success or failure in achieving objectives. The local or regional plan should serve five functions. It should provide technical and policy guidelines for accomplishing the intent of the local or regional agency. It should provide a framework of standards for planning and implementation. It should provide for an integrated system of approved storage, collection, transport, resource recovery, and final disposition of solid waste. It should establish methods for translating the plant into system design and direct operations. Finally, it should serve as a legislative support document. The plan should be coordinated with State and Federal guideline and laws, all other plans, such as sewer and health department policies, and with the private sector of collection and disposal operations. A simple, eight-step model shows the basic planning structure, although the actual planning process is dynamic and not static, as it appears on paper. As objectives are considered and alternatives weighed, a competent interdisciplinary staff is essential to suggest and evaluate various methods of waste handlings. (D)(G)

STATUS

SWIRS Library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Michigan Towns Sell Regional Authority Bonds.

CITATION

N/A

ABSTRACT/SUMMARY

In 1967, five municipalities in Berrien County, Michigan, with a combined population of 77,000 people, individually took stock of their disposal facilities and concluded that they were faced with a state of emergency. For a number of years, each had been discarding its solid wastes at open dumps situated in swampy river areas, resulting in pollution of the local streams. After studying the costs involved in setting up a sanitary landfill in each of the five regions, it was decided to band together to start a single, common landfill. The Northwestern Berrien County Sanitation Authority was established. The landfill was financed by selling negotiable bonds through the Detroit stock exchange. The Authority hired, a private hauler, to be full time superintendent of the site. To get the operation started a John Deere self-elevating scraper, a small Deere wheel tractor with front end loader, a Clark CS-70 Trash-Pak, and an American Hoist crane and dragline were purchased. Since the site was on flat land, with no natural ravines or hills, converting to a landfill meeting state specifications and also local regulations took a great deal of time and excavating. The disposal trench currently in use is 70 ft. wide, 20 ft. deep and 1,400 ft. long. Its life expectancy is a year to 18 months, which the entire site is expected to last more than a decade. All of the 800 to 900 cu. yd. of household, commercial, and industrial wastes generated in the five municipalities each day must be taken to the Authority's landfill, according to regulations. At the landfill each vehicle is charged/cu. yd. rather than by weight. No one dumps free at the site. Every member of the Authority pays the same rate and there are no discounts for volume.

STATUS

Retained in the SWIRS Library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Intergovernmental Approaches to Solid Waste Management

CITATION

N/A

ABSTRACT/SUMMARY

Solid waste management must be approached according to the concept of an integrated management system within a framework of maximum operational authority. Adoption of this broad approach will frequently require a transcending of jurisdictional boundaries. Consequently, intergovernmental approaches must be taken. Urban, rural, and statewide interstate regions can be related to and modeled on intergovernmental solid waste management groups. Options such as joint powers and services agreements, contractural arrangements, and overall operational organizations incorporating the advantages of authorities, compacts, and utilities could be used. Development of an integrated management system includes the organization of the region-wide intergovernmental jurisdiction and an actual operating unit. In planning the system, consideration must be given to finances, manpower, equipment and facilities management, and control and evaluation of the system's operation and performance. Examples of the kind of coordination discussed are given for various levels, and their applicability as guidelines is evaluated. (G)

STATUS

N/A

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Economic Aspects of Regional Versus Local Solid Waste Management

CITATION

Owens, R. J. M.S. Thesis, University of Washington, (Seattle), 1971. 67 p.

ABSTRACT/SUMMARY

The economic considerations in the determination of the optimal area and facility sized for solid waste management systems are examined. Solid waste collection costs do not appear to vary with the size of the area served. Economics of scale exist in all transportation systems when the distances remain constant. The major savings in reported disposal costs occur by enlarging sanitary landfills to 120 tons per day and incinerators to 600 tons per day. Cost evaluation of reclamation processes is not available at this time. Savings obtained by enlarging service areas of treatment, transfer, or disposal faciliteis must be added to transportation costs to obtain optimum area sizes. The radius of optimum area size was found to decrease with increasing population density, per capita waste generation, and transportation costs. The sensitivity of optimum area sizes to cost variables was also found to decrease with population density. Data are included on the variables affecting collection costs. The factors that influence the design life of a sanitary landfill site are variable and often unquantifiable, but an effort is made to develop equations to determine the optimum life of a site. The computerized determination of optimum area sizes is included.

STATUS

This document is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

The Utility Concept

CITATION

McGauhey, P.H., Waste Age, The Utility Concept, Volume 2, # 3, May-June 1971

ABSTRACT/SUMMARY

The utility concept is the idea that refuse collection and disposal should be regarded as one of the municipal or regional utilities, just as water supply, electric power, and waste water treatment. Although regional plans have been developed for management of air pollution, water pollution and resource utilization, similar actions have not yet been taken in the less glamorous solid waste field. Increasing public consciousness of such concepts as resource recovery may change this image, and place soild waste management higher on the list of government action priorities. Each utility engaged in the solid waste management field would have different authorities and activities. The most common activity would be the operation of a system responsible for refuse collection and transportation to transfer stations. Disposal arrangements would vary, however, under a regional plan where they surely would not consist of merely exporting the wastes into adjacent territory and dumping them, as had been practiced by some municipalities, in the past. The second function would be that of collecting reasonable fees for the services performed. These fees would avoid the usurpation of local privileges. Considering the efficiency and flexibility which the utility concept offers, it is surprising that it has not received much consideration heretofore. (D) (G).

STATUS

SWIRS Library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

The Name of the Game is Service

CITATION

Porter, Robert; Waste Age Vol. 2 #3 Date: May-June 1

ABSTRACT/SUMMARY

Chapter 28E Code of Iowa provides for the creation of regional agencies such as those which are appropriate in solid waste collection and disposal. Under this enabling legislation, the Des Moines Metropolitan Area Solid Waste agency was set up. Of the municipalities in the area, only the city of Des Moines has turned over its solid waste management to the agency, but others are negotiating to do so. Only residential refuse is handled, and a fee of from $2 to $8 per residence is charged. Larger buildings and industrial establishments are serviced by private contractors. The agency acquired the city landfill site and all the equipment used by the city when collection was transferred to its jurisdiction. Personnel, too, was transferred and offered the same benefits as the city has provided. Since the Landfill must be self-suupporting, rates have been raised to $.50 per cu yd. At the new site, charges will be made by the ton. Members of the agency are now free to leave at any time, although after revenue bonds are issued to purchase land and equipment this will no longer be true. Most of the area towns realize that the ultimate solution to solid waste disposal problems is a regional agency, and now that the agency is operating within its budget and providing good service, it will undoubtedly grow.

STATUS

N/A

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Service Areas

CITATION

Roy F. Weston, Environmental Scientists and Engineers, A Statewide Comprehensive Solid Waste Management Study; Albany, New York; N. Y. State Department of Health; Feb. 1970

ABSTRACT/SUMMARY

The advantages of regionalization are lower unit costs, better operation, more effective site selection, more thorough preplanning, and a sounder basis for financing. Inability to obtain cooperation between municipalities has hampered any plans along these lines. In order to achieve regionalization, the State will have to take responsibility for promoting it. The term 'service area' has been chosen to designate a portion of the State for which cooperative solid waste effort is appropriate. The most important objective in delineating a service area is to realize the least cost consistent with the most effective and manageable disposal means. A list of selected State-owned lands indicates that 27 percent of them would be needed for disposal of solid wastes. Tables are presented for service areas, acreage requirements for disposal of future wastes by sanitary landfill, operating costs of future landfill sites, and projected land requirements. (D)(G)

STATUS

SWIRS Library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

The Problem that Won't Go Away.

CITATION

The Problem that Won't Go Away; New York State Dept. of Health;

ABSTRACT/SUMMARY

Suffolk County's solid waste disposal is splintered among more than a dozen separate jurisdictions at various levels; county, town, village, state, and federal institutions. Local jurisdictions have not had the means for the planning and record-keeping that growth now demands for Suffolk. Essential functions can be accomplished most effectively and most economically at the central level. A plan has been developed for regional control and administration of solid waste disposal. Adoption of practical, modern methods for reducing the volume of waste and disposing of it is an important aspect of the plan. An overall program for improvement and extension of existing disposal facilities is needed. Coordinated regulations, record-keeping, and monitoring would benefit the county. It is estimated that proposed new refuse facilites, plus operation and improvement of existing facilities will cost property owners an average of 49¢ in property taxes/$100 of assessed valuation over the next 25 years.

STATUS

SWIRS Library # Accession #7644

INFORMATION/CONTACT

PROJECT/TITLE

Land Use and Industrial Site Selection.

CITATION

Varin, Daniel W; Recent Developments in Industrial Pollution Control; Proceedings of the Fourth Annual Northeastern Regional Antipollution Conference, University of Rhode Island. July 13-15, 1971;Technomic Publishing Co.

ABSTRACT/SUMMARY

Planning for industrial growth is part of the State plan for the State of Rhode Island. Economic well-being for its residents is one aim of the State, and its goals in this area are to improve opportunities for maximum productive employment through continued industrial development, to make full use of manpower development resources, to reduce unemployment and underemployment, and to increase real and disposable income. In the realm of industrial site selection, Rhode Island intends: to make efficient use of available land to promote a pleasing, coherent, and workable environment; to stabilize older central cities; to control urban sprawl and dispersion; to reduce urban blight; to sustain economic growth at the maximum rate consistent with regional resources; and to reduce stream pollution to levels set in the State's water quality classification plan. The guide designed to implement the plan provides for the public facilities needed to support the proposed land use pattern. The industrial site chosen were selected with consideration of utility services, transportation, soil, topography and drainage, and compatibility with existing land use. The plan allocates about 30 sq miles to all industrial purposes, as compared with 10 or 11 sq miles in use now for industry. (D)(G)

STATUS

This document is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Areawide Approaches

CITATION

Guidelines for Local Governments on Solid Waste Management. Public Health Service Publication No. 2084; Washington, D.C.; U.S. Gov. Printing Office; 1971

ABSTRACT/SUMMARY

An areawide approach to solid waste management will insure a comprehensive progrm. Evidence of solid waste mismanagement can be found in pollution of land, water, and air. These pollutions must be seen as interrelated. An areawide approach should include the widest feasible geography and be projected for disposal sites to last for 20 years. County governments and metropolitan councils of government are examples of such areas. In some places special districts set up for purposes such as taxing can perform the function of the areawide government. State action in areawide programs thus far has mainly been in technical assistance. Intergovernmental cooperation can be accomplished in a variety of ways: formal or informal agreements, contract, joint management, or transfer of function. (D)(G)

Areawide planning is the responsibility of local elected officials. Planning must be accepted by the citizens and be in accord with basic State requirements. The first step in the planning process is collecting data on physical factors, population and land use, solid waste types and quantities, and regulations. Systems analysis can be a useful tool in interpreting information. Implementation requires captial budgeting and active support. A list of solid waste planning agencies in each State with addresses is included. (D)(G)

STATUS

This document is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Regionally Consolidated Industrial Wastewater Treatment

CITATION

National Industrial Pollution Control Council; 34 pages ; Washington, D.C.
U.S. Government Printing Office; Feb. 1971

ABSTRACT/SUMMARY

This booklet discusses the regional waste water treatment plant as a solution for industries which must clean up their effluents before discharging them into waterways. An attempt will be made to identify the range of tehcnical, economic, and social issues that pertain to the disposal of waterborne wastes of a regional grouping of industries and possibly one or more municipalities. The critical issues that must be resolved before industries can and will join in such regional programs are noted. The system is described from a theoretical viewpoint and then evaluated in terms of the alternative available to two geographical areas, the San Francisco Bay-Delta and the Cuyahoga River in Ohio. The specific costs, environmental implications, and institutional requirements involved in these two areas are dealt with.

Environmental quality models are included in the booklet.

STATUS

This document is retained in the SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Criteria for Regional Solid Waste Management Planning

CITATION

B. H. Stevens, Regional Science Research institute Philadelphia. Pa.

ABSTRACT/SUMMARY

This report consists of a collection of studies on selected aspects of the problem of regional solid waste management planning. The research efforts fall into three main subject areas; the economics of solid waste generation,recycling, and disposal, the economic and social effects of landfills, and the issues involved in local—intergovernmental cooperation for regional solid waste management. The individual studies are the following: "A Framework for Evaluating the Economic Effects of Regional Solid Waste Systems","Production Functions for Solid Waste Disposal", "Solid Waste Generation Coefficients; Manufacturing Sectors", Solid Waste Generation Coefficient; Non-Manufacturing Sectors", Preceptions of Landfill Operations Held by Nearby Residents", and "Efforts at Intermunicipal Cooperation for Solid Waste Disposal. Why They Fail . The report also includes a summary of the studies.

STATUS

Publication available. NTIS-PB 239631 $9.50

INFORMATION/CONTACT

Talley, R. J.
513-684-4484

PROJECT/TITLE

Lee County Solid Waste Management Project

CITATION

N/A

ABSTRACT/SUMMARY

Solid waste disposal in both the incorporated municipalities and rural areas of Lee County was unsatisfactory. The City of Tupelo made an attempt at operating a sanitary landfill in an undesirable location. With poor operation, the results were open burning, water pollution, and insect and rodent production. Disposal sites for other areas of the county were nothing more than open dumps. Garbage and rubbish collection was provided by the City of Tupelo, the towns of Nettleton and Saltillo, and by one private collection service. The citizens of the other towns hauled away their own solid wastes. Garbage storage is known to be very poor at most of the homes in the samll towns. The prime objective of the project was to demonstrate the feasibility of a county-wide plan for solid waste management. A centrally-located sanitary landfill near Tupelo was operated by the county for disposal.

The solid waste management project was sucessful, and, as a result, most counties in Mississippi are now using a system of mobile containers.

The wells around the landfills are continously monitored. To date, there has been no evidence of leaching.

STATUS

The final report was sent to EPA in 1/74.

INFORMATION/CONTACT

Tommy Dablis
703 Crossover Road
Tupelo, Miss. 38801
601-842-7381

PROJECT/TITLE

Evaluation of Feasibility and Economic Implication of Pricing Mechanisms in Solid Waste Management

CITATION

E. Ernest, ABT Associates, Inc. Cambridge, MA.

ABSTRACT

This study analyzes the potential of pricing mechanisms in solid waste management systems. Such pricing mechanisms have been suggested as appropriate means for encouraging greater efficiency of resource, both within the solid waste management system proper and among sources of solid wastes. The study reviews the limited empirical evidence concerning supply and demand characteristics in markets for solid waste management (primary collection) services. The analysis of processing and disposal and ancillary Solid Waste Management services is hampered by the diversity of existing systems, and remaining problems in the conceptual clarification of the services provided. The analysis of cost functions in the Collection and Transportation subsystem suggests that these cost functions are subject to variable returns to scale. For smaller communities, there are economies of scale with respect to the amount of waste handled. For larger communities, scale effects vanish. The available literature provides sufficiently strong evidence for the importance of both prices (and pricing policies) and incomes as determinants of the amount of waste collected per household. This evidence is used in an exploratory numerical analysis employing decision-theoretic elements to assess the likely impact of pricing mechanisms. The analysis suggests that total system costs could be reduced through pricing mechanisms, even though there would be a tendency to rely more on self-disposal as prices for collection services increase. The study concludes with a brief suggestion for a feasible method for implementing an effective pricing mechanism in SWM systems.

STATUS

Publication available. NTIS PB 239116/AS $4.75

INFORMATION/CONTACT

Goddard, H. C. 513-684-4484

PROJECT/TITLE

Intergovernmental Aspects of Environmental Control: Problems Presented by Legal and Administrative Arrangements--A Critical Recapitulation

CITATION

F. P. Grad and G. W. Rathjens, and A. J. Rosenthal

ABSTRACT/SUMMARY

One of the major problems that the present pattern of rule-making and enforcement in environmental law presents to effective environmental management is the lack of a unified policy and the disjunctiveness of regulatory and enforcement activities. There is no integrative principle that in some way ties the Federal and State development programs into the State and Federal environmental control effort. Also, present legislation too often separates the responsibility for rule-making and standard setting from the responsibility for enforcement by lodging them at different levels of government, thus rendering the regulatory effort less effective.

In the planning for effective environmental controls, the appropriate level of government to make policies and rules and to carry out or enforce them must be considered. The question involves the proper size of government's territorial jurisdiction if it is to operate effectively in the control of environmental pollution. The issue is not only what level of government should appropriately regulate the problem, but whether the policymaking and standard setting functions need to be the responsibility of the same level of government that is primarily responsible for enforcement.

The provisions of the National Environmental Policy Act of 1969 are reviewed and the powers and actions of Council of Environmental Policy are discussed. The effects of environmental impact statement on pollution control are examined. The agencies and functions now combined in EPA are identified, and the problems related to the creation of the agency are described.

STATUS

SWIRS library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Regional Management of Animal Manures

CITATION

Dodd, V.A., D.F. Lyons, and J. R. O'Callaghan.

ABSTRACT/SUMMARY

It is proposed that a centralized storage facility should be provided for a group of pig and/or poultry units. The manure that is collected and brought to the central store can be disposed of by spreading on land in a separate operation. A mathematical, analytical model is constructed to determine the best place to locate the central store, and spead the manure. The model was applied to a specific region containing 58 pig fattening units. Results showed that the system may be economically attractive, having as additional advantages the minimization of pollutional hazards and the relieving of the pig or poultry farmer of the task of manure management.

STATUS

SWIRS Library.

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Framework for Analyzing and Selecting Among Alternativesfor Regional Solid Waste Management

CITATION

N.A

ABSTRACT/SUMMARY

Considerable interest and suggestions concerning economies of scale in regional solid waste management systems have been expressed. The economic feasibility of regional solid waste management was investigated. Primary emphasis was on the development of a model framework to facilitate analysis and selection among alternatives for regional solid waste management systems, including implications for regional economics.

STATUS

Publication Pending. EPA # 670/5-74-006

INFORMATION/CONTACT

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PROJECT/TITLE

NEC Environmental Impact Study

CITATION

N/A

ABSTRACT/SUMMARY

Appropriate measures of environmental impacts were defined for each pollution category and type pollutant--air, water, solid waste, noise, thermal, radiation, and land use. Methodology was developed for projecting north east corridor (NEC) impact levels to 1985 that incorporate key variables as population growth and density, and currently planned programs for pollution and environmental control. Extent of total environmental impacts stemming from NEC transportation activities was isolated and evaluated in light of total problem. Consequences of alternative transportation programs and policies for the NEC will be examined as a way of improving the environmental quality of this region.

STATUS

Document provided to S.S.I.E. by the H.R.I.S. Information Service
Completed. Copy available at cost of printng.

INFORMATION/CONTACT

Mr. Charles Lerner
656-2700

PROJECT/TITLE

Environmental Carrying Capacity As A Concept In Comprehensive Regional Planning - A Feasibility Study

CITATION

N/A

ABSTRACT

In response to the need to better understand the impacts of development and management activities across entire regional systems, this research examined approaches for measuring and understanding the capacity of regional environments to absorb or support activities in such areas as resource use, land development, waste disposal, transportation, wildlife and watershed management. The focus was upon environmental carrying capacity of regional systems and subsystems as a concept for assessing changes in environmental quality due to large-scale development, management and planning activities, and as a basis for planning and decision-making models and methods. In this regard, efforts were made to define and develop indicators for measuring carrying capacity, to identify approaches for defining and describing a region, to identify parameters necessary to design and implement models of regional carrying capacity, to assess data requirements and strategies for data collection and management, to indicate procedures for validating or testing potential models, and to identify facilities, personnel, and estimated costs for model development.

STATUS

Project completed. Publication pending. EPA #600/5-74-021

INFORMATION/CONTACT

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PROJECT/TITLE

Joint Siting of Electrical Power Plant and Advanced Wastewater Treatment Plant Feasibility Study

CITATION

N/A

ABSTRACT/SUMMARY

Description: The purpose of this study was to evaluate five advanced wastewater treatment (AWT) plant sites and various treatment processes, including land disposal and sludge. Joint siting of an electrical power plant and an AWT plant was considered because of the possibility of reducing the overall envrionmental impact as compared to separate siting. Alternatives affiliated with the power plant include the following: location of the AWT plant at the power plant site, using clear effluent as make up to the power plants cooling towers and burning the AWT plant's organic solids in the power plant's furnaces; locating the AWT plant at a lower basin site with clear water transmitted to the power plant and alternate methods sludge disposal; land disposal of sludge in connection with the power plant's use of partially treated wastewater. The study concludes that to meet the quality standards, for discharges into the Potomac River, treatment processes are limited to AWT or land disposal. Land disposal requires considerably more land than an AWT plant and would consequently cost more and displace more families. For those and other reasons, an AWT plant is recommended. The joint location of the AWT plant and the power plant proved to have many advantages and to be entirely feasible and acceptable from the technical, economic, and environmental viewpoints. However, due to community reaction and sociopolitical factors, the joint siting project was rejected by the governing body. Plant is under design and is nearly completed. Construction is scheduled for next year. (1976)

STATUS

A detailed environmental impact study of an Areawide Waste Treatment and Delivery System for Montogomery County, Md. was done by Battelle Memorial in August 1974. Region 3 is working to complete a similiar draft for the Region 3 area.

INFORMATION/CONTACT

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Region 3

PROJECT/TITLE

The Better Whey; A Dilemma

CITATION

Proceedings: Second National Symposium on Food Processing Wastes, Sidney Boxer. U.S. Environmental Protection Agency, Wash., D.C. 3/1971. pp. 409-412.

ABSTRACT/SUMMARY

The cheese industry has the problems of waste whey, a heavy pollutant because of its high BOD and yet a food by-product with excellent nutritive value. Dairy Research and Development Corporation suggests the establishment of regional whey recovery plants to treat the whey from surrounding industries since whey recovery is such an expensive process that small dairy processing plants cannot afford to install the equipment. This research and development outfit has built a demonstration plant at Vernon, New York in cooperation with Dairylea of New York. Whole whey for use as a food or food additive is recovered at this facility by spray drying, the most efficient and economical method discovered by previous research. Laval Separator Company has built the equipment for the demonstration plant. One of the major problems encountered in this project was the conversion of cottage cheese whey, which is more acidic than hard-cheese whey and more difficult to process. (D) (G)

This document is retained in the SWIRS library.

STATUS

N/A

INFORMATION CONTACT

N/A

Part III Other

PROJECT/TITLE

Comprehensive Studies of Solid Waste

CITATION

Annual reports nos. 1 and 2 Colueke, C. G.; McGauhey, P.H. California University Berkeley. 1970; 480p

ABSTRACT/SUMMARY

The contents of this publication are as follows: data collection and evaluation: (literature survey and information retrieval; characteristics and amounts of solid wastes; waste generation in Santa Clara County; definition and coordination of research areas); waste generation and evaluation model; waste collection-treatment-disposal model; waste generation input and management system inputs; planning and economics; (development of pertinent data on quantity and types of solid waste) solid waste generation and land-use planning.

STATUS

Available from NTIS-Pb-218 265 $0.95 GPO/MF

INFORMATION/CONTACT

N/A

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PROJECT/TITLE

Projects in the Industrial Pollution Division - December 1974

CITATION

Industrial Pollution Pollutant Control Division, EPA Washington, D.C.

ABSTRACT/SUMMARY

Project of the Industrial Pollution Control Program-December 1974 is a compilation of information sheets from projects initiated since fiscal year 1967 through fiscal year 1974. Each sheet contains the objectives, statistical information, and a brief description of the project. General introductory information on the Federal Industrial Pollution Control Program is also presented to provide perspective on the magnitude of industrial pollution and the research directions that must be pursued in order to develop the technology to adequately control this largest point source of pollution in the United States.

STATUS

Publication Pending. #600/2-75 001

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Solid Waste Disposal Economics. A Bibliography with Abstracts. Rept. for 1970 - Sept 74.

CITATION

National Technical Information Service, Springfield, Va. Nov. 74; 92p

ABSTRACT/SUMMARY

The bibliography contains 76 selected abstracts of research reports retrieved using the NTIS on-line search system-Ntisearch. The topics include all aspects of the economics of solid waste disposal and abatement, including studies concerning industries, transportation, urban planning, and recycling.

STATUS

NTIS ps-74/092 pc $2.00/MF $20.00

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Urban Solid Waste Management

CITATION

Lehmann, Edward J., National Technical Information Service, Springfield Va.

ABSTRACT/SUMMARY

This bibliography contains 142 selected abstracts of research reports retrieved using the NTIS on-line search system--Ntisearch. The topics selected cover all aspects of solid waste management for urban areas. The reports include economics, collection methods, recycling, sanitary landfills, and urban planning.

STATUS

Available from NITS/ps 74/105 pc $20.00/MF $20.00

INFORMATION/CONTACT

N/A

PROJECT/TITLE

Areawide Refuse Disposal

CITATION

Areawide Refuse Disposal, O'Toole, Michael J., Troy, N. York, Rensselaer Polytechnic Institute, 1/ 1970

ABSTRACT/SUMMARY

Nine arewide comprehensive refuse reports covering many counties of various populations, economic make-up, and development were analyzed. The basic facts, needs, and relathionships most often found to be essential in the master planning, development, and implementation of programs to handle refuse problems economically and efficiently were determined. Governmental units by examining the material developed, may gain insight into the means of going about solving their own particular refuse problems. The study reports point out the major economical, operational, and administrative advantages of refuse disposal operations conducted on an areawide basis. Consequently, areawide or regional refuse disposal operations were most often recommended; the recommendations, however, have proven somewhat difficult to implement. The study showed that refuse collection is ususally by one of three common methods, namely municipal contract, or private collectors. The use of the uncontrolled "dump" is still the most commonly used disposal method. Refuse collection can be handled best if left at the local level. Refuse disposal and transfer operations can be handled most economically and effectively on an areawide basis. The sanitary landfill because of its economy, is the most often recommended method of refuse disposal. At the present time the county is the unit of local government best equipped to control and administer areawide refuse disposal operations though regionalization will evolve from properly functioning county operations.

STATUS

SWIRS Library.

INFORMATION/CONTACT

N/A

REFERENCES

National Technical Information Service - Abstracts

Office of Research and Development Publications Summary (EPA)

Office of Solid Waste Management - Available Information Materials Catalogues

Smithsonian Science Information Exchange - Summaries of Research In Progress

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